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US ARMY TEST & EVALUATION COMMAND



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USATECOM PROJECT NO. 8-4-0210-02-C
FINAL REPORT OF ENGINEERING TEST OF
CARTRIDGE, 5.56-MM, TRACER, XM196
REPORT NO. DPS-1687
JUNE 1965

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ABERDEEN PROVING GROUND
ABERDEEN PROVING GROUND, MARYLAND

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ABSTRACT

This report describes the engineering test of cartridge, tracer, 5.56-mm, XM196. The purpose of the test was to determine cartridge physical dimensions, accuracy, tracer performance, cook-off, vibration effects, brush deflection, erosion, penetration (pine board, steel helmet, and armored vest), and gun functioning. The test was conducted at APG between 15 July 1964 and 16 March 1965. The characteristics of the test item were determined. It was recommended that the test cartridge be considered suitable for use with the M16 and M16E1 rifles.

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USATECOM PROJECT NO. 8-4-0210-02-C
FINAL REPORT OF ENGINEERING TEST OF
CARTRIDGE, 5.56-MM, TRACER, XM196
15 JULY 1964 TO 16 MARCH 1965

SECTION 1. GENERAL

1.1 REFERENCES

1. Engineering Test Plan for Cartridge, Tracer, 5.56-MM, XM196, USATECOM Project No. 8-4-0210-02C, May 1964.
2. First Letter Report on Engineering Test of Cartridge, Tracer, 5.56-MM, XM196, USATECOM Project No. 8-4-0210-02C, 26 October 1964.
3. Military Specification: Cartridge, 5.56-MM, Tracer, XM196. MIL-C-60111(MJ), 17 March 1964.
4. Military Specification: Cartridge, 7.62-MM, NATO, Tracer, M62. MIL-C-46281-B(MJ) Amend 1, 7 October 1963.

1.2 AUTHORITY

The authority to proceed with the conduct of test is the USATECOM Test Directive 8-4-0210-02C, 3 April 1964 (Appendix V).

1.3 OBJECTIVES

To determine the suitability of the XM196 cartridge for use in the M16 rifle. Since no QMR, Military Characteristics, or Technical Characteristics were available for the test cartridge, the M62 tracer round fired in the M14 rifle was used for comparative purposes.

1.4 RESPONSIBILITIES

Development and Proof Services, Aberdeen Proving Ground, Md., was responsible for planning, executing, and reporting the engineering testing.

1.5 DESCRIPTION OF MATERIEL

The XM196 tracer cartridge consists of the standard 5.56-mm cartridge case and primer assembly. The bullet has a gilding metal jacket around a halved lead core. The pyrotechnic components which are located to the rear of the halved lead core, consist of the igniter and tracer mix. The assembled bullet weighs approximately 55 grains and is flat-based. The bullet tip is colored orange to facilitate identification (Appendix III).

1.6 BACKGROUND

Rifles, 5.56-mm, M16 and XM16E1, and cartridge, ball, M193 have been adopted for use by the US Air Force and by the US Army Special Forces, Airborne, and air assault units. Cartridge, tracer, XM196 is being developed for use in the M16 and XM16E1 rifles.

1.7 FINDINGS

The physical characteristics of the test cartridge complied with drawing C10534193 (Appendix IV).

Accuracy targets were fired simultaneously at ranges of 100, 300, and 600 yards. When firing the XM196 tracer ammunition, the average mean radius of all targets at 100 yards was 1.6 inches; at 300 yards, 5.1 inches; and at 600 yards, 11.0 inches. When firing the M193 ball ammunition, the average mean radius of all targets at 100 yards was 1.2 inches; at 300 yards, 3.6 inches; and at 600 yards, 8.4 inches. The requirements of Reference 3 can be met by interpolating the average mean radius of the targets to 200 yards range.

The XM196 tracer ammunition conditioned at +70°F and fired at night revealed that 98% of the rounds traced with an average length of trace of 830 yards.

The conditioning of the test ammunition to +155°F and -65°F increased the number of delays. The trace of the XM196 was more difficult to observe, from all positions, in bright daylight than that of the M62. The length of trace of the test ammunition complied with Reference 3.

A cook-off occurred with both the XM196 and M193 cartridges when 140 rounds were fired as rapidly as possible. No cook-off occurred at the 120-round level.

Visual examination of the test cartridges subjected to the vibration test revealed that the points of the projectiles were slightly flattened and the red identification lacquer was chipped off the projectile tips. When these rounds were fired 76% of the rounds traced normally.

The average mean radius of the accuracy targets fired during the erosion test using M193 ammunition was 1.4 inches. The largest velocity drop from the initial burst was 62 fps. The average mean radius of the accuracy targets fired using XM196 ammunition was 1.6 inches. The largest velocity drop from the initial burst was 65 fps. The average mean radius of the accuracy targets fired using both M193 and XM196 ammunition was 1.5 inches. The largest velocity drop from the initial burst was 95 fps.

The five record impacts, with each type (XM196, M193, M62, and M80) of ammunition, completely perforated the front and rear of the helmet and liner at ranges of 100 and 300 yards. At a range of 600 yards, four XM196 projectiles perforated the front of the helmet and liner and the rear liner; one round perforated only the front of the helmet and liner. Two M193 projectiles perforated the front of the helmet and liner and the rear liner; three rounds did not penetrate the helmet. Four M62 projectiles perforated the front and rear of the helmet and liner; one round perforated the front of the helmet and liner and rear of the liner. All five M80 projectiles perforated the front and rear of the helmet and liner.

The number of pine boards, spaced 1-inch apart, perforated at ranges of 100, 300, and 600 yards using M193 ammunition was 11, 16, and 7; using XM196 ammunition, 24, 17, and 7; using M80 ammunition, 12, 11, and 14; using M62 ammunition, 42, 34, and 19, respectively.

All rounds (XM196, M193, M62, and M80) perforated armored vests at ranges of 100, 300, and 600 yards. (One thickness of vest was offered as a target.)

No malfunctions occurred with either type of ammunition (XM196 and M193) with the weapons held in the various attitudes.

1.8 CONCLUSIONS

It is concluded that:

- a. The physical characteristics, trace characteristics, and accuracy of the XM196 cartridge complied with Reference 3 (ref pars. 2.1, 2.2, 2.3, and Appendix I).
- b. A cook-off can be expected with either the XM196 or M193 round when more than 120 rounds are fired as rapidly as possible in the M16 rifle (ref par. 2.4 and Appendix I).
- c. The vibration of the XM196 cartridge caused delays in trace (ref pars. 2.3 and 2.5).
- d. The erosion characteristics of the XM196 cartridge are comparable to those of the M193 cartridge (ref par. 2.7 and Appendix I).
- e. The attitude of the weapon does not affect functioning when firing either the XM196 or M193 cartridge (ref par. 2.9).

1.9 RECOMMENDATION

It is recommended that cartridge, 5.56-mm, tracer, XM196 be considered suitable for use with the M16 and XM16E1 rifles.

SECTION 2. DETAILS OF TEST

2. INTRODUCTION

This test was conducted to determine the physical and ballistic characteristics of the XM196 cartridge. The M193 tracer round, fired in the M14 rifle, was used for comparative purposes.

2.1 INSPECTION

2.1.1 Objective

To determine the physical characteristics of the test item.

2.1.2 Method

Ten rounds of each (XM196 and M193) cartridge were disassembled and the components were measured and weighed.

2.1.3 Results

A summary of results is given in Table 1.

Table 1. Summary of Inspection Data

| No. of Rds | Avg Wt of Components, gr | | | | Avg Measurement of Components, in. | | | |
|---|--------------------------|-------------------|-----------------------|-----------------|---------------------------------------|----------------|---------------------------------|---------------------------|
| | Bullet | IMR 4475 Prop. | Primed Ctg Case | Complete Ctg | Bullet Length | Bullet Diam | Primed Ctg Case Length | Complete Ctg Length |
| Cartridge: 5.56-mm; ball, M193, lot RA-5027 (control). | | | | | | | | |
| 10 | 54.90 | 24.90 | 94.39 | 174.19 | 0.746 | 0.224 | 1.757 | 2.247 |
| Cartridge: 5.56-mm; tracer, XM196, lot RA-223-115 (test). | | | | | | | | |
| 10 | 51.88 | 23.97 | 94.93 | 170.78 | 0.881 | 0.224 | 1.755 | 2.248 |

2.1.4 Analysis

Not applicable.

2.2 ACCURACY

2.2.1 Objective

To determine the accuracy of the test cartridge.

2.2.2 Method

Five 10-shot groups, in each of three M16 rifles, were fired from a machine rest with both XM196 tracer and M193 ball ammunition. The groups were obtained simultaneously at ranges of 100, 300, and 600 yards. The center of impact at each range with reference to an index line was determined. The cartridge type was alternated after each 10-shot group.

2.2.3 Results

A summary of results is given in Table II.

Table II. Summary of Accuracy Data

| Average Data for Five Targets, in. | | | | | | | | | | | |
|------------------------------------|-----------|-----|-----|-----|------|------|------|-----------------------|-------|---------|------|
| Rifle No. | Ammo Type | MR | MID | MVD | EHD | EVD | ES | CI from Line of Sight | | Std Dev | |
| | | | | | | | | Hor | Vert | Hor | Vert |
| Range: 100 yards. | | | | | | | | | | | |
| 008625 | Ball | 1.2 | 0.7 | 0.8 | 2.8 | 3.3 | 3.8 | - 1.2 | 2.7 | 0.9 | 1.1 |
| | Tracer | 1.7 | 1.1 | 1.1 | 4.4 | 4.2 | 5.3 | - 0.1 | 3.3 | 1.3 | 1.4 |
| 023295 | Ball | 1.3 | 0.8 | 0.9 | 3.7 | 3.6 | 4.5 | 0.0 | 1.0 | 1.1 | 1.1 |
| | Tracer | 1.4 | 0.9 | 0.9 | 3.7 | 3.7 | 4.4 | 0.6 | - 0.2 | 1.1 | 1.2 |
| 023348 | Ball | 1.0 | 0.5 | 0.7 | 2.2 | 2.7 | 3.1 | 2.6 | 2.7 | 0.7 | 0.9 |
| | Tracer | 1.7 | 1.1 | 1.2 | 4.1 | 5.7 | 6.5 | 2.4 | 3.5 | 1.4 | 1.7 |
| Range: 300 yards. | | | | | | | | | | | |
| 008625 | Ball | 3.8 | 2.2 | 2.5 | 8.6 | 10.5 | 11.3 | - 3.7 | - 1.8 | 2.8 | 3.3 |
| | Tracer | 5.2 | 3.3 | 3.4 | 13.6 | 12.3 | 15.9 | - 0.6 | 0.4 | 4.2 | 4.1 |
| 023295 | Ball | 4.0 | 2.6 | 2.7 | 11.8 | 11.0 | 14.2 | 1.4 | - 6.4 | 3.5 | 3.4 |
| | Tracer | 4.6 | 2.8 | 3.0 | 11.7 | 11.9 | 13.8 | 3.7 | - 9.8 | 3.7 | 3.8 |

Table II (Cont'd)

| Rifle No. | Ammo Type | Average Data for Five Targets, in. | | | | | | | | Std Dev | |
|-------------------|-----------|------------------------------------|-----|-----|------|------|------|-----------------------|-------|---------|------|
| | | MR | MID | MVD | EMD | EVD | ES | CI from Line of Sight | | Hor | Vert |
| | | | | | | | | Hor | Vert | | |
| 023348 | Ball | 3.0 | 1.8 | 2.1 | 7.6 | 8.2 | 10.1 | 7.9 | - 1.3 | 2.4 | 2.6 |
| | Tracer | 5.6 | 3.5 | 3.6 | 13.0 | 17.8 | 20.1 | 8.0 | 1.4 | 4.5 | 5.0 |
| Range: 600 yards. | | | | | | | | | | | |
| 008625 | Ball | 8.7 | 4.6 | 6.6 | 17.2 | 25.0 | 27.0 | - 3.6 | -77.2 | 5.8 | 8.3 |
| | Tracer | 11.5 | 7.1 | 7.6 | 28.3 | 25.8 | 34.0 | 2.6 | -69.7 | 9.1 | 9.3 |
| 023295 | Ball | 9.0 | 5.4 | 6.2 | 25.7 | 25.6 | 31.2 | 7.8 | -88.7 | 7.5 | 7.8 |
| | Tracer | 10.5 | 6.6 | 6.6 | 27.6 | 27.0 | 32.4 | 13.9 | -90.4 | 8.7 | 8.6 |
| 023348 | Ball | 7.6 | 5.1 | 5.0 | 20.3 | 19.6 | 26.2 | 11.9 | -74.2 | 6.5 | 6.2 |
| | Tracer | 11.0 | 7.0 | 7.1 | 25.0 | 32.2 | 34.7 | 14.5 | -71.4 | 8.7 | 9.5 |

Notes: Targets were fired at ranges of 100, 300, and 600 yards simultaneously.
 Cartridge, 5.56-mm; ball, M193, lot RA-5027 (control).
 Cartridge, 5.56-mm; tracer, XM196, lot RA-223-115 (test).

2.2.4 Analysis

Not applicable.

2.3 TRACE

2.3.1 Objective

To determine the trace characteristics of the test cartridge.

2.3.2 Method

One hundred test cartridges, at ambient temperature, were fired from each of three M16 rifles under each of three light conditions (bright daylight, overcast daylight, and night). A similar number of M62 rounds was fired from three M14 rifles under the same light conditions. This procedure was repeated with cartridges conditioned at +155°F and -65°F for 4 hours prior to firing. The distance to initiation of trace, length of trace, and visibility characteristics were determined.

2.3.3 Results

A summary of results is given in Table III.

Table III. Summary of Trace Data

| Ammo Temp, °F | Avg Length of Trace, yd | Per Cent of Trace | Remarks |
|----------------------------|-------------------------------|-------------------------|----------------------------|
| Weapon: M16. | | | Ammunition: XM196. |
| Weapon No.: 008625. | | | Light Condition: Night. |
| Ambient | 835 | 99 | One blind. |
| +155 | 817 | 98 | Two delays. |
| - 65 | 820 | 96 | Four delays. |
| Weapon No.: 023295. | | | |
| Ambient | 830 | 97 | Three blind. |
| +155 | 831 | 98 | Two blind. |
| - 65 | 805 | 97 | Two blind; one delay. |
| Weapon No.: 023348. | | | |
| Ambient | 830 | 99 | One blind. |
| +155 | 831 | 98 | Two blind. |
| - 65 | 813 | 91 | Nine delays. |
| Weapon No.: 008625. | | | |
| Light Condition: Overcast. | | | |
| Ambient | 725 | 100 | |
| +155 | 745 | 91 | One blind; eight delays. |
| - 65 | 675 | 72 | Six blind; 22 delays. |
| Weapon No.: 023295. | | | |
| Ambient | 700 | 99 | One blind. |
| +155 | 750 | 83 | Three blind; 14 delays. |
| - 65 | 680 | 72 | Nine blind; 19 delays. |
| Weapon No.: 023348. | | | |
| Ambient | 740 | 97 | One blind; two delays. |
| +155 | 750 | 78 | Three blind; 19 delays. |
| - 65 | 700 | 59 | Nineteen blind; 22 delays. |

Table III (Cont'd)

| Ammo Temp, °F | Avg Length of Trace, yd | Per Cent of Trace | Remarks |
|-----------------------------------|-------------------------------|-----------------------------------|--|
| Weapon No.: 008625. | | | |
| Light Condition: Bright daylight. | | | |
| Ambient | - | - | Trace not visible from firing position. Barely visible at 75 yards (just a flash). |
| +155 | ^a 478 | - | Trace observed from firing position. Barely visible at 75 yards. |
| - 65 | ^a 445 | - | Trace observed from firing position. Not visible at other positions. |
| Weapon No.: 023295. | | | |
| Ambient | - | - | Trace not visible from firing position. Barely visible at 75 yards (just a flash). |
| +155 | - | - | Trace visible intermittently at firing position and 75 yards. |
| - 65 | ^a 463 | - | Trace observed from firing position. |
| Weapon No.: 023348. | | | |
| Ambient | - | - | Trace not visible from firing position. Barely visible at 75 yards (just a flash). |
| +155 | - | - | Trace visible intermittently at firing and 75-yard positions. |
| - 65 | ^a 395 | - | Trace observed from firing position. Not visible at other positions. |
| Weapon: M14. | | Ammunition: M62. | |
| Weapon No.: 1563467. | | Light Condition: Bright daylight. | |
| Ambient | ^a 515 | 98 | Two blinds. Trace visible from firing position, sometimes at 75- and 100-yard positions. |
| +155 | ^a 644 | 98 | Two blinds. Trace visible from firing position, sometimes at 75- and 100-yard positions. |
| - 65 | ^a 761 | 96 | Four blinds. Trace visible from firing position. |

^aLength of trace estimated from firing position.

Table III (Cont'd)

| Ammo Temp, °F | Avg Length of Trace, yd | Per Cent of Trace | Remarks |
|----------------------------|-------------------------------|-------------------------|--|
| Weapon No.: 1568022. | | | |
| Ambient | ^a 485 | 99 | One blind. Trace visible from firing position, sometimes at 75- and 100-yard positions. |
| +155 | ^a 682 | 97 | Three blinds. Trace visible from firing position, sometimes at 75- and 100-yard positions. |
| - 65 | 770 | 96 | Four blinds. |
| Weapon No.: 1574901. | | | |
| Ambient | ^a 465 | 97 | Three blinds. Trace visible from firing position, sometimes at 75- and 100-yard positions. |
| +155 | ^a 570 | 95 | Five blinds. Trace visible from firing position, sometimes at 75- and 100-yard positions. |
| - 65 | 725 | 99 | One blind. |
| Weapon No.: 1563467. | | | |
| Light Condition: Overcast. | | | |
| Ambient | 1020 | 97 | Three blinds. |
| +155 | 1015 | 96 | Four blinds. |
| - 65 | 925 | 90 | Ten blinds. |
| Weapon No.: 1568022. | | | |
| Ambient | 1005 | 95 | Five blinds. |
| +155 | 1020 | 99 | One blind. |
| - 65 | 935 | 89 | Eleven blinds. |
| Weapon No.: 1574901. | | | |
| Ambient | 1000 | 96 | Four blinds. |
| +155 | 1025 | 97 | Three blinds. |
| - 65 | 950 | 82 | Eighteen blinds. |

^aLength of trace estimated from firing position.

Table III (Cont'd)

| Ammo Temp, °F | Avg Length of Trace, yd | Per Cent of Trace | Remarks |
|-------------------------|-------------------------|-------------------|------------------------------------|
| Weapon No.: 1563467. | | | |
| Light Condition: Night. | | | |
| Ambient | 1000 | 97 | Two blinds; one delay. |
| +155 | 1032 | 94 | Four blinds; two long. |
| - 65 | 1048 | 91 | Eight blinds; one long. |
| Weapon No.: 1568022. | | | |
| Ambient | 1005 | 100 | |
| +155 | 1030 | 99 | One blind. |
| - 65 | 1057 | 89 | Five blinds; six delays. |
| Weapon No.: 1574901. | | | |
| Ambient | 998 | 94 | Three blinds; three long. |
| +155 | 1025 | 87 | Six blinds; five delays; two long. |
| - 65 | 1054 | 89 | Six blinds; five delays. |

Blind = No trace.

Delay in M62 = Trace started after 100 yards (Reference 4).

Delay in XM196 = Trace started after 75 yards (Reference 3).

Long = Trace started before 15 yards (Reference 4).

2.3.4 Analysis

Not applicable.

2.4 COOK-OFF

2.4.1 Objective

To determine the maximum number of tracer cartridges that can be safely fired from the M16 rifle without the occurrence of a premature function caused by chamber heating.

2.4.2 Method

The level, in number of rounds fired, at which a cook-off occurs was bracketed using both the tracer and ball rounds. Firing was conducted

as rapidly as possible using preloaded magazines. The time for firing and the time from insertion of the round to the cook-off were recorded.

2.4.3 Results

A summary of results is given in Table IV.

Table IV. Summary of Cook-Off Data

| <u>Rifle No.</u> | <u>No. Rds Fired</u> | <u>Time to Fire Rds, sec</u> | <u>Time for Cook-Off to Occur, sec</u> |
|--------------------|----------------------|------------------------------|--|
| Ammunition: XM196. | | | |
| 007239 | 119 | 68.9 | No cook-off in 10 minutes |
| 008651 | 140 | 69.3 | No cook-off in 10 minutes |
| 007239 | 140 | 44.0 | 30.7 |
| 008651 | 120 | 36.8 | No cook-off in 10 minutes |
| 007239 | 120 | 34.1 | No cook-off in 10 minutes |
| 008651 | 140 | 47.1 | 36.3 |
| Ammunition: M193. | | | |
| 007239 | 140 | 46.7 | 41.2 |
| 007239 | 120 | 36.3 | No cook-off in 10 minutes |
| 008651 | 120 | 31.9 | No cook-off in 10 minutes |
| 007239 | 140 | 51.2 | 42.7 |

2.4.4 Analysis

Not applicable.

2.5 VIBRATION

2.5.1 Objective

To determine the ability of the test cartridge to withstand vibrations caused by firing the M16 rifle.

2.5.2 Method

Five test rounds, one dummy round, and ten additional rounds were placed in a magazine. Ten rounds were fired. The dummy round was replaced in the magazine, and ten rounds were again placed on top of the dummy round and fired. This procedure was repeated until 100 rounds were fired. The five test rounds were then removed and inspected for damage. This procedure was repeated with nine additional magazines. The rounds positioned in the bottom of the magazine were fired during overcast conditions and the trace was observed.

2.5.3 Results

Visual examination of the cartridges revealed that the points of the projectiles were slightly flattened and the red identification lacquer was chipped off on the projectile tips only. This insignificant damage was caused by the projectile points impacting against the inside of the magazine when the 50 test rounds were fired, two blinds and ten tracer initiations beyond 75 yards were observed. The average length of trace was 745 yards.

2.5.4 Analysis

Not applicable.

2.6 BRUSH DEFLECTION

2.6.1 Objective

To determine the deflection characteristics of the test cartridge.

2.6.2 Method

Ten XM196 and ten M62 bullets were impacted on a 1/2-inch-diameter birch dowel pin at a range of 25 yards. The point of impact on the peg, and the path, degree of yaw, and orientation of yaw during the first 75 yards after impact on the peg were determined by means of 32 targets.

2.6.3 Results

Results are contained in Appendix I.

2.6.4 Analysis

It was agreed (because of time and expense limitations) at the initiation of the test program that the brush deflection data would not be analyzed, but would be presented in such a form that if future detailed evaluation were needed, the data in this report could readily be used. All pertinent data required for detailed evaluation are shown in Appendix I.

2.7. EROSION

2.7.1 Objective

To determine the erosion characteristics of the test cartridge.

2.7.2 Method

Six thousand rounds each of the XM196 tracer and M193 ball cartridges were fired from two M16 rifles to compare the erosion characteristics of the two cartridges. After this firing, a third rifle was fired using 3000 rounds of each cartridge (6000 total) to determine the effect of firing mixed cartridges on erosion life of the M16 rifle. The rate of fire was 20 rounds per minute. The rifles were cooled after each 100 rounds of firing.

Firing was alternated between semiautomatic and automatic fire after each 100 rounds. The rifle was disassembled and cleaned after each 1000 rounds of firing. Ball and tracer ammunition were alternated in the third rifle after each 100 rounds and an equal number of rounds of each type was fired automatically. The bores of the rifles were measured before and after the test and at 2000-round intervals. The accuracy and velocity were determined before and after the test and at 2000-round intervals. Five 10-round targets were fired from each rifle from a machine rest at a range of 100 yards in each accuracy test phase; velocity was recorded. The rifle firing both ball and tracer ammunition was fired with the tracer round and the rifles firing only ball and only tracer ammunition were fired with the same cartridge in the accuracy test phase.

2.7.3 Results

A summary of results is given in Table V.

Table V. Summary of Erosion Accuracy Targets

| Average for Five Targets, in. | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|--------------------------|-------|---------|------|--------------------|
| Phase | MR | MID | MVD | EID | EVD | ES | CI from Line of Sight | | Std Dev | | Avg Vel, fps |
| | | | | | | | Hor | Vert | Hor | Vert | |
| Rifle No.: 007721. Type Ammunition: Ball. | | | | | | | | | | | |
| Range: 100 yards. | | | | | | | | | | | |
| Before test | 1.9 | 1.0 | 1.4 | 4.2 | 6.5 | 7.2 | 3.5 | 8.3 | 1.3 | 2.0 | 3117 |
| After 2000 rds | 1.2 | 0.7 | 0.8 | 3.0 | 3.4 | 4.0 | 5.9 | - 0.7 | 0.9 | 1.0 | 3123 |
| After 4000 rds | 1.2 | 0.7 | 0.8 | 3.0 | 3.1 | 3.8 | 3.0 | 2.4 | 0.9 | 1.0 | 3064 |
| After 6000 rds | 1.2 | 0.7 | 0.9 | 3.2 | 4.2 | 4.7 | -2.6 | 1.6 | 0.9 | 1.3 | 3055 |
| Rifle No.: 008651. Type Ammunition: Tracer. | | | | | | | | | | | |
| Before test | 1.4 | 0.9 | 0.9 | 3.5 | 3.9 | 4.5 | -4.3 | - 2.9 | 1.2 | 1.2 | 3125 |
| After 2000 rds | 1.6 | 1.0 | 1.0 | 3.6 | 4.0 | 4.7 | 5.2 | 10.9 | 1.2 | 1.2 | 3108 |
| After 4000 rds | 1.3 | 0.8 | 0.9 | 3.3 | 3.9 | 4.3 | -8.8 | 10.2 | 1.0 | 1.2 | 3045 |
| After 6000 rds | 1.6 | 1.0 | 1.0 | 3.7 | 4.2 | 5.0 | -4.8 | 4.7 | 1.3 | 1.3 | 3030 |
| Rifle No.: 007239. | | | | | | | | | | | |
| Before test | 1.7 | 1.1 | 1.1 | 4.5 | 4.3 | 5.6 | 4.0 | 1.6 | 1.4 | 1.4 | 3138 |
| After 2000 rds | 1.6 | 1.0 | 1.0 | 3.3 | 3.8 | 4.4 | -3.8 | 4.1 | 1.3 | 1.2 | 3111 |
| After 4000 rds | 1.5 | 1.0 | 1.0 | 3.3 | 4.0 | 4.7 | 3.6 | 10.2 | 1.1 | 1.3 | 3088 |
| After 6000 rds | 1.4 | 1.1 | 0.7 | 4.6 | 3.1 | 5.1 | 9.5 | 1.6 | 1.4 | 0.9 | 3073 |

2.7.4 Analysis

Not applicable.

2.8 PENETRATION

2.8.1 Objective

To determine the penetration characteristics of the test cartridge.

2.8.2 Method

A series of test cartridges were fired to impact on pine boards, steel helmets, and armor vests at ranges of 100, 300, and 600 yards. The series consisted of enough rounds to accumulate five desirable impacts on each type target at each range.

The method as outlined was repeated using the M193, 5.56-mm ball cartridge; the M80, 7.62-mm ball cartridge; and the M62, 7.62-mm tracer cartridge for comparison.

2.8.3 Results

A summary of results is given in Table VI.

Table VI. Summary of Penetration Data

| <u>Round</u> <u>No.</u> | <u>Ammunition</u> |
|----------------------------|-------------------|
| Helmets and Liners | |
| Range: 100 yards. | |
| a ₁ to 5 | M62 tracer |
| a ₁ to 5 | M80 ball |
| a ₁ to 5 | XM196 tracer |
| a ₁ to 5 | M193 ball |
| Range: 300 yards. | |
| a ₁ to 5 | M62 tracer |
| a ₁ to 5 | M80 ball |
| a ₁ to 5 | XM196 tracer |
| a ₁ to 5 | M193 ball |

^aAll rounds completely perforated front and rear of helmet and liner.

Table VI (Cont'd)

| <u>Round No.</u> | <u>Ammunition</u> |
|----------------------|-------------------|
| Range: 600 yards. | |
| b ₁ | XM196 tracer |
| b ₂ | XM196 tracer |
| c ₃ | XM196 tracer |
| d ₄ | XM196 tracer |
| b ₅ | XM196 tracer |
| e ₁ | M193 ball |
| e ₂ | M193 ball |
| e ₃ | M193 ball |
| b ₄ | M193 ball |
| b ₅ | M193 ball |
| a ₁ to 4 | M62 tracer |
| b ₅ | M62 tracer |
| a ₁ to 5 | M80 ball |

Vests

Ranges: 100, 300, and 600 yards.

All rounds (XM196, M193, M62, and M80) perforated the front of the vests at all ranges (100, 300, and 600 yards). Only the one thickness of the vest was offered as a target.

^aAll rounds completely perforated front and rear of helmet and liner.

^bRound completely penetrated front of helmet and liner and rear liner. Dented rear of helmet.

^cRound completely perforated front of helmet and liner and rear liner. Missed rear of helmet.

^dRound completely penetrated front of helmet and liner. Did not penetrate rear of liner.

^eRound dented front of helmet and broke front of helmet liner.

Table VI (Cont'd)

Penetration Test

Material: Pine boards.

| Cartridge, 5.56-MM | | | | | | | Cartridge, 7.62-MM: NATO | | | | | | | | | |
|--------------------|------------|------|----|---------------|----|------|--------------------------|-----------|----|------|-------------|----|----|------|----|----|
| Hit | Ball, M193 | | | Tracer, XM196 | | | Hit | Ball, M80 | | | Tracer, M62 | | | | | |
| No. | C | Perf | CP | PP | C | Perf | CP | PP | C | Perf | CP | PP | C | Perf | CP | PP |
| Range: 100 yards. | | | | | | | | | | | | | | | | |
| 1 | 11 | - | 12 | 24 | - | 25 | 1 | 12 | - | 13 | 41 | - | 42 | | | |
| 2 | 10 | - | 11 | 24 | - | 25 | 2 | 12 | - | 13 | 41 | - | 42 | | | |
| 3 | 11 | - | 12 | 24 | 25 | - | 3 | 11 | 12 | - | 43 | - | 44 | | | |
| 4 | 10 | - | 11 | 24 | - | 25 | 4 | 11 | - | 12 | 41 | - | 42 | | | |
| 5 | 11 | - | 12 | 25 | - | 25 | 5 | 14 | - | 15 | 42 | - | - | | | |
| Avg | 11 | - | 12 | 24 | 25 | 25 | Avg | 12 | 12 | 13 | 42 | - | 43 | | | |
| Range: 300 yards. | | | | | | | | | | | | | | | | |
| 1 | 9 | - | 10 | 17 | - | 18 | 1 | 11 | 12 | - | 34 | 35 | - | | | |
| 2 | 10 | - | 11 | 18 | 19 | - | 2 | 10 | - | 11 | 34 | 35 | - | | | |
| 3 | 20 | - | 21 | 17 | - | 18 | 3 | 10 | 11 | - | 35 | 36 | - | | | |
| 4 | 19 | 20 | - | 16 | 17 | - | 4 | 11 | 12 | - | 35 | - | 36 | | | |
| 5 | 21 | - | 22 | 18 | - | 19 | 5 | 11 | - | 12 | 34 | 35 | - | | | |
| Avg | 16 | 20 | 13 | 17 | 18 | 18 | Avg | 11 | 12 | 12 | 34 | 35 | 36 | | | |
| Range: 600 yards. | | | | | | | | | | | | | | | | |
| 1 | 8 | - | 9 | 7 | - | 8 | 1 | 11 | - | 12 | 18 | - | 19 | | | |
| 2 | 8 | - | 9 | 6 | - | 7 | 2 | 17 | - | 18 | 20 | - | 21 | | | |
| 3 | 7 | 8 | - | 7 | 8 | - | 3 | 20 | - | 21 | 20 | - | 21 | | | |
| 4 | 7 | 8 | - | 8 | - | 9 | 4 | 11 | - | 12 | 20 | - | 21 | | | |
| 5 | 7 | - | 8 | 8 | - | 9 | 5 | 9 | - | 10 | 19 | - | 20 | | | |
| Avg | 7 | 8 | 9 | 7 | 8 | 8 | Avg | 14 | - | 15 | 19 | - | 20 | | | |

Legend:

- C Perf = Complete perforation, round passed completely through the board.
 CP = Complete penetration, round left a hole which light could be observed through.
 PP = Partial penetration, round entered board but did not leave a hole that light could be observed through.

2.8.4 Analysis

Greater pine-board penetration at longer ranges with the 5.56-mm and 7.62-mm ball bullets is attributed to a decrease in projectile yaw with an increase in range.

2.9 FUNCTIONING

2.9.1 Objective

To determine if the XM196 cartridge produces sufficient operating energy to insure reliable automatic functioning of the XM16E1 rifle when fired with the weapon held in various positions.

2.9.2 Method

Twenty rounds were fired semiautomatic and twenty rounds automatic using both the M193 and XM196 cartridges, in each of three weapons. The weapons were held at the following attitudes:

- a. Left side up, from the shoulder.
- b. Right side up, from the shoulder.
- c. Upside down, from the shoulder.
- d. Loosely in the hands, from the hip.
- e. Forty-five degree elevation, from the shoulder.
- f. Forty-five degree depression, from the shoulder.
- g. Ninety degree depression, from the shoulder.

2.9.3 Results

There were no malfunctions with either type ammunition with the weapons held in any one of the positions.

2.9.4 Analysis

Not applicable.

SECTION 3. APPENDICES

APPENDIX I - TEST DATA

Measurement and Weight Data

Cartridge, 5.56-MM: Ball, M193, lot RA-5027 (control).

Cartridge, 5.56-MM: Tracer, XM196, lot RA-223-115 (test).

| Wt, gr | | | | | Wt, gr | | | | |
|------------|-------------|------------|----------|----------|------------|--------------|------------|--------|----------|
| Sample No. | IMR | | | | Sample No. | IMR | | | |
| | M193 Bullet | 4475 Prop. | Primed | Complete | | XM196 Bullet | 4475 Prop. | Primed | Complete |
| | | | Ctg Case | | | | | Ctg | |
| 1 | 54.77 | 24.60 | 93.89 | 173.26 | 1 | 51.85 | 23.97 | 95.35 | 171.17 |
| 2 | 54.87 | 24.87 | 94.10 | 173.84 | 2 | 51.85 | 23.96 | 95.68 | 171.49 |
| 3 | 54.95 | 24.87 | 93.13 | 172.95 | 3 | 51.66 | 23.98 | 95.21 | 170.85 |
| 4 | 54.80 | 24.81 | 94.38 | 173.99 | 4 | 52.03 | 24.04 | 94.97 | 171.04 |
| 5 | 55.38 | 25.25 | 93.33 | 173.96 | 5 | 51.92 | 23.98 | 93.39 | 169.29 |
| 6 | 54.73 | 25.03 | 94.55 | 174.31 | 6 | 51.97 | 24.08 | 95.09 | 171.14 |
| 7 | 54.82 | 24.63 | 95.09 | 174.54 | 7 | 51.74 | 23.85 | 94.49 | 170.08 |
| 8 | 54.85 | 24.92 | 94.78 | 174.55 | 8 | 51.62 | 23.90 | 95.36 | 170.88 |
| 9 | 54.83 | 25.16 | 96.54 | 176.53 | 9 | 52.16 | 23.93 | 94.80 | 170.89 |
| 10 | 54.97 | 24.85 | 94.12 | 173.94 | 10 | 52.00 | 23.99 | 94.95 | 170.94 |
| Avg | 54.90 | 24.90 | 94.39 | 174.19 | Avg | 51.88 | 23.97 | 94.93 | 170.78 |

| Measurements, in. | | | | | Measurements, in. | | | | |
|-------------------|-------------|-------|----------|--------------|-------------------|--------------|-------|--------|--------------|
| Sample No. | M193 Bullet | | Length | | Sample No. | XM196 Bullet | | Length | |
| | Length | Diam | Primed | Complete Ctg | | Length | Diam | Primed | Complete Ctg |
| | | | Ctg Case | | | | | Ctg | |
| 1 | 0.743 | 0.224 | 1.757 | 2.246 | 1 | 0.877 | 0.224 | 1.756 | 2.249 |
| 2 | .742 | .224 | 1.756 | 2.248 | 2 | .876 | .224 | 1.756 | 2.248 |
| 3 | .748 | .224 | 1.755 | 2.245 | 3 | .880 | .224 | 1.755 | 2.246 |
| 4 | .747 | .224 | 1.757 | 2.246 | 4 | .879 | .224 | 1.755 | 2.246 |
| 5 | .731 | .224 | 1.756 | 2.246 | 5 | .883 | .224 | 1.755 | 2.249 |
| 6 | .746 | .224 | 1.757 | 2.246 | 6 | .879 | .224 | 1.754 | 2.250 |
| 7 | .751 | .224 | 1.758 | 2.250 | 7 | .874 | .224 | 1.755 | 2.248 |
| 8 | .748 | .224 | 1.760 | 2.246 | 8 | .882 | .224 | 1.755 | 2.248 |
| 9 | .748 | .224 | 1.757 | 2.246 | 9 | .890 | .224 | 1.755 | 2.246 |
| 10 | .753 | .224 | 1.755 | 2.247 | 10 | .886 | .224 | 1.754 | 2.249 |
| Avg | 0.746 | 0.224 | 1.757 | 2.247 | Avg | 0.881 | 0.224 | 1.755 | 2.248 |

Round-by-Round Data

Legend

S = Semiautomatic fire.
A = Automatic fire.
SS = Single shot fire.
SAT = Satisfactory.
FF = Failure to feed cartridge.
F2R = Fired two rounds automatic.
DF = Double feed.
FFR = Failure to fire cartridge.
FX = Failure to extract cartridge case.
FCB = Fired upon closing bolt without pulling trigger.

Weapons: Rifle, caliber .223, Colt, AR-15, model 02, serial No. 008625.
Rifle, caliber .223, Colt, AR-15, model 02 (XM16E1), serial No. 023295.
Rifle, caliber .223, Colt, AR-15, model 02 (XM16E1), serial No. 023348.
Rifle, caliber .223, Colt, AR-15, model 01, serial No. 007239.
Rifle, caliber .223, Colt, AR-15, model 01, serial No. 007721.
Rifle, caliber .223, Colt, AR-15, model 01, serial No. 008651.

Ammunition: Cartridge, 5.56-mm, ball, M193, lot RA-5027.
Cartridge, 5.56-mm, tracer, XM196, lot RA-223-115.

| No. Rds Fired | Type of Ctg | No. of Ctg Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Func | Remarks |
|---------------------|-------------------|------------------------|------------------------|--------------------|-----------------------|--------------------|------|---------|
|---------------------|-------------------|------------------------|------------------------|--------------------|-----------------------|--------------------|------|---------|

Phase 2.2, Accuracy

Date Fired: 28 July 1964.

| | | | | | | | | |
|----|------|----|--------|----|----|----|-----|-------------------------------|
| 13 | M193 | 13 | 008625 | 13 | 13 | SS | SAT | Settling and locating rounds. |
|----|------|----|--------|----|----|----|-----|-------------------------------|

Date Fired: 29 July 1964.

| | | | | | | | | |
|----|------|----|--|----|----|----|-----|------------------|
| 25 | M193 | 38 | | 38 | 38 | SS | SAT | Locating rounds. |
|----|------|----|--|----|----|----|-----|------------------|

Date Fired: 30 July 1964.

| | | | | | | | | |
|----|-------|----|--|----|----|----|-----|-----------------|
| 2 | M193 | 40 | | 40 | 40 | SS | SAT | Warming rounds. |
| 10 | M193 | 50 | | 50 | 50 | SS | SAT | Target No. 1. |
| 10 | XM196 | 10 | | 60 | 60 | SS | SAT | Target No. 2. |
| 10 | M193 | 60 | | 70 | 70 | SS | SAT | Target No. 3. |
| 10 | XM196 | 20 | | 80 | 80 | SS | SAT | Target No. 4. |

| No. Rds Fired | Type of Ctg | No. of Ctg Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|------------------------|------------------------|--------------------|-----------------------|--------------------|-------|----------------|
| 10 | M193 | 70 | | 90 | 90 | SS | SAT | Target No. 5. |
| 10 | XM196 | 30 | | 100 | 100 | SS | SAT | Target No. 6. |
| 10 | M193 | 80 | | 110 | 110 | SS | SAT | Target No. 7. |
| 10 | XM196 | 40 | | 120 | 120 | SS | SAT | Target No. 8. |
| 10 | M193 | 90 | | 130 | 130 | SS | SAT | Target No. 9. |
| 10 | XM196 | 50 | | 140 | 140 | SS | SAT | Target No. 10. |

Date Fired: 31 July 1964.

| | | | | | | | | |
|----|-------|-----|--------|----|-----|----|-----|-------------------------------|
| 46 | M193 | 136 | 023295 | 46 | 186 | SS | SAT | Settling and locating rounds. |
| 21 | XM196 | 71 | | 67 | 207 | SS | SAT | |

Date Fired: 3 August 1964.

| | | | | | | | | |
|----|-------|-----|--|-----|-----|----|-----|------------------|
| 14 | M193 | 150 | | 81 | 221 | SS | SAT | Locating rounds. |
| 19 | XM196 | 90 | | 100 | 240 | SS | SAT | |

Date Fired: 4 August 1964.

| | | | | | | | | |
|----|-------|-----|--|-----|-----|----|-----|------------------------------|
| 10 | M193 | 160 | | 110 | 250 | SS | SAT | Locating and warming rounds. |
| 10 | XM196 | 100 | | 120 | 260 | SS | SAT | |
| 10 | M193 | 170 | | 130 | 270 | SS | SAT | Target No. 11. |
| 10 | XM196 | 110 | | 140 | 280 | SS | SAT | Target No. 12. |
| 10 | M193 | 180 | | 150 | 290 | SS | SAT | Target No. 13. |
| 10 | XM196 | 120 | | 160 | 300 | SS | SAT | Target No. 14. |
| 10 | M193 | 190 | | 170 | 310 | SS | SAT | Target No. 15. |
| 10 | XM196 | 130 | | 180 | 320 | SS | SAT | Target No. 16. |
| 10 | M193 | 200 | | 190 | 330 | SS | SAT | Target No. 17. |
| 10 | XM196 | 140 | | 200 | 340 | SS | SAT | Target No. 18. |
| 10 | M193 | 210 | | 210 | 350 | SS | SAT | Target No. 19. |
| 10 | XM196 | 150 | | 220 | 360 | SS | SAT | Target No. 20. |

| | | | | | | | | |
|---|-------|-----|--------|----|-----|----|-----|-------------------------------|
| 5 | M193 | 215 | 023348 | 5 | 365 | SS | SAT | Settling and locating rounds. |
| 5 | XM196 | 155 | | 10 | 370 | SS | SAT | |

Date Fired: 5 August 1964.

| | | | | | | | | |
|----|-------|-----|--------|----|-----|----|-----|------------------------------|
| 5 | M193 | 220 | | 15 | 375 | SS | SAT | Locating and warming rounds. |
| 5 | XM196 | 160 | | 20 | 380 | SS | SAT | |
| 10 | M193 | 230 | | 30 | 390 | SS | SAT | Target No. 21. |
| 10 | XM196 | 170 | | 40 | 400 | SS | SAT | Target No. 22. |
| 10 | M193 | 240 | | 50 | 410 | SS | SAT | Target No. 23. |
| 10 | XM196 | 180 | | 60 | 420 | SS | SAT | Target No. 24. |
| 10 | M193 | 250 | | 70 | 430 | SS | SAT | Target No. 25. |
| 10 | XM196 | 190 | 023348 | 80 | 440 | SS | SAT | Target No. 26. |
| 10 | M193 | 260 | | 90 | 450 | SS | SAT | Target No. 27. |

| No. Rds Fired | Type of Ctg | No. of Ctg Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|------------------------|------------------------|--------------------|-----------------------|--------------------|-------|----------------|
| 10 | XM196 | 200 | | 100 | 460 | SS | SAT | Target No. 28. |
| 10 | M193 | 270 | | 110 | 470 | SS | SAT | Target No. 29. |
| 10 | XM196 | 210 | | 120 | 480 | SS | SAT | Target No. 30. |

Phase 2.7, Erosion

Date Fired: 11 August 1964.

| | | | | | | | | |
|----|-------|-----|--------|----|-----|----|-----|--------------------------------------|
| 20 | M193 | 290 | 007721 | 20 | 500 | SS | SAT | Settling and locating rounds. |
| 10 | M193 | 300 | | 30 | 510 | SS | SAT | Target No. 31. |
| 10 | | 310 | | 40 | 520 | SS | SAT | Target No. 32. |
| 10 | | 320 | | 50 | 530 | SS | SAT | Target No. 33. |
| 10 | | 330 | | 60 | 540 | SS | SAT | Target No. 34. |
| 10 | | 340 | | 70 | 550 | SS | SAT | Target No. 35, one primer punch out. |
| 20 | XM196 | 230 | 008651 | 20 | 570 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 240 | | 30 | 580 | SS | SAT | Target No. 36. |
| 10 | | 250 | | 40 | 590 | SS | SAT | Target No. 37. |
| 10 | | 260 | | 50 | 600 | SS | SAT | Target No. 38. |
| 10 | | 270 | | 60 | 610 | SS | SAT | Target No. 39. |
| 10 | | 280 | | 70 | 620 | SS | SAT | Target No. 40. |

Date Fired: 12 August 1964.

| | | | | | | | | |
|-----|-------|-----|--------|-----|------|----|-----|-------------------------------|
| 20 | XM196 | 300 | 007239 | 20 | 640 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 310 | | 30 | 650 | SS | SAT | Target No. 41. |
| 10 | | 320 | | 40 | 660 | SS | SAT | Target No. 42. |
| 10 | | 330 | | 50 | 670 | SS | SAT | Target No. 43. |
| 10 | | 340 | | 60 | 680 | SS | | Target No. 44. |
| 10 | | 350 | | 70 | 690 | SS | | Target No. 45. |
| 30 | XM196 | 380 | 007239 | 100 | 720 | S | SAT | |
| 100 | | 480 | | 200 | 820 | A | SAT | |
| 30 | M193 | 370 | 007721 | 100 | 850 | S | SAT | |
| 100 | | 470 | | 200 | 950 | A | SAT | |
| 30 | XM196 | 510 | 008651 | 100 | 980 | S | SAT | |
| 100 | M193 | 570 | | 200 | 1080 | A | SAT | |
| 100 | XM196 | 610 | 007239 | 300 | 1180 | S | SAT | |
| 100 | M193 | 670 | 007721 | 300 | 1280 | S | SAT | |
| 100 | XM196 | 710 | 008651 | 300 | 1380 | S | SAT | |
| 100 | XM196 | 810 | 007239 | 400 | 1480 | A | SAT | |
| 100 | M193 | 770 | 007721 | 400 | 1580 | A | SAT | |
| 100 | M193 | 870 | 008651 | 400 | 1680 | A | SAT | |

| No. Rds Fired | Type of Ctg | No. of Ctg Type Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|--------------------------------|------------------------|--------------------|-----------------------|--------------------|---------------|-----------------------|
| 100 | XM196 | 910 | 007239 | 500 | 1780 | S | SAT | |
| 100 | M193 | 970 | 007721 | 500 | 1880 | S | SAT | |
| 100 | XM196 | 1010 | 008651 | 500 | 1980 | S | SAT | |
| 100 | XM196 | 1110 | 007239 | 600 | 2080 | A | SAT | |
| 100 | M193 | 1070 | 007721 | 600 | 2180 | A | SAT | |
| 100 | M193 | 1170 | 008651 | 600 | 2280 | A | SAT | |
| 100 | XM196 | 1210 | 007239 | 700 | 2380 | S | SAT | |
| 100 | M193 | 1270 | 007721 | 700 | 2480 | S | 1-FF 1-F2R | One primer punch out. |
| 100 | XM196 | 1310 | 008651 | 700 | 2580 | S | SAT | |
| 100 | XM196 | 1410 | 007239 | 800 | 2680 | A | SAT | |
| 100 | M193 | 1370 | 007721 | 800 | 2780 | A | 2-FF | |
| 100 | M193 | 1470 | 008651 | 800 | 2880 | A | SAT | |

Date Fired: 13 August 1964.

| | | | | | | | |
|-----|-------|------|--------|------|------|---|------|
| 100 | XM196 | 1510 | 007239 | 900 | 2980 | S | SAT |
| 100 | M193 | 1570 | 007721 | 900 | 3080 | S | SAT |
| 100 | XM196 | 1610 | 008651 | 900 | 3180 | S | SAT |
| 100 | XM196 | 1710 | 007239 | 1000 | 3280 | A | SAT |
| 100 | M193 | 1670 | 007721 | 1000 | 3380 | A | 1-DF |
| 100 | M193 | 1770 | 008651 | 1000 | 3480 | A | SAT |

Weapons were disassembled, cleaned, inspected, lubricated, and reassembled.

| | | | | | | | |
|-----|-------|------|--------|------|------|---|-------|
| 100 | XM196 | 1810 | 007239 | 1100 | 3580 | A | SAT |
| 100 | M193 | 1870 | 007721 | 1100 | 3680 | A | SAT |
| 100 | XM196 | 1910 | 008651 | 1100 | 3780 | A | SAT |
| 100 | XM196 | 2010 | 007239 | 1200 | 3880 | S | SAT |
| 100 | M193 | 1970 | 007721 | 1200 | 3980 | S | 4-F2R |
| 100 | M193 | 2070 | 008651 | 1200 | 4080 | S | SAT |
| 100 | XM196 | 2110 | 007239 | 1300 | 4180 | A | SAT |
| 100 | M193 | 2170 | 007721 | 1300 | 4280 | A | SAT |
| 100 | XM196 | 2210 | 008651 | 1300 | 4380 | A | SAT |
| 100 | XM196 | 2310 | 007239 | 1400 | 4480 | S | SAT |
| 100 | M193 | 2270 | 007721 | 1400 | 4580 | S | 3-F2R |
| 100 | M193 | 2370 | 008651 | 1400 | 4680 | S | SAT |
| 100 | XM196 | 2410 | 007239 | 1500 | 4780 | A | SAT |
| 100 | M193 | 2470 | 007721 | 1500 | 4880 | A | SAT |
| 100 | XM196 | 2510 | 008651 | 1500 | 4980 | A | SAT |
| 100 | XM196 | 2610 | 007239 | 1600 | 5080 | S | SAT |
| 100 | M193 | 2570 | 007721 | 1600 | 5180 | S | 2-F2R |
| 100 | M193 | 2670 | 008651 | 1600 | 5280 | S | SAT |

| No. Rds Fired | Type of Ctg | No. of Ctg Type Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|--------------------------------|------------------------|--------------------|-----------------------|--------------------|---------------|---------------------|
| 100 | XM196 | 2710 | 007239 | 1700 | 5380 | A | 2-DF | Caused by magazine. |
| 100 | M193 | 2770 | 007721 | 1700 | 5480 | A | SAT | |
| 100 | XM196 | 2810 | 008651 | 1700 | 5580 | A | SAT | |
| 100 | XM196 | 2910 | 007239 | 1800 | 5680 | S | SAT | |
| 100 | M193 | 2870 | 007721 | 1800 | 5780 | S | 4-F2R | |
| 100 | M193 | 2970 | 008651 | 1800 | 5880 | S | SAT | |
| 100 | XM196 | 3010 | 007239 | 1900 | 5980 | A | SAT | |
| 100 | M193 | 3070 | 007721 | 1900 | 6080 | A | SAT | |
| 100 | XM196 | 3110 | 008651 | 1900 | 6180 | A | SAT | |
| 100 | XM196 | 3210 | 007239 | 2000 | 6280 | S | SAT | |
| 100 | M193 | 3170 | 007721 | 2000 | 6380 | S | 1-DF 8-F2R | |
| 100 | M193 | 3270 | 008651 | 2000 | 6480 | S | SAT | |

Weapons were disassembled, cleaned, inspected, lubricated, and reassembled. Barrels were star-gaged after firing 2000 rounds through each.

Date Fired: 14 August 1964.

| | | | | | | | | |
|-----|-------|------|--------|------|------|----|-------|-------------------------------|
| 10 | XM196 | 3220 | 007239 | 2010 | 6490 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 3230 | | 2020 | 6500 | SS | SAT | Target No. 46. |
| 10 | | 3240 | | 2030 | 6510 | SS | SAT | Target No. 47. |
| 10 | | 3250 | | 2040 | 6520 | SS | SAT | Target No. 48. |
| 10 | | 3260 | | 2050 | 6530 | SS | SAT | Target No. 49. |
| 10 | | 3270 | | 2060 | 6540 | SS | SAT | Target No. 50. |
| 10 | M193 | 3280 | 007721 | 2010 | 6550 | SS | SAT | Settling and locating rounds. |
| 10 | M193 | 3290 | | 2020 | 6560 | SS | SAT | Target No. 51. |
| 10 | | 3300 | | 2030 | 6570 | SS | SAT | Target No. 52. |
| 10 | | 3310 | | 2040 | 6580 | SS | SAT | Target No. 53. |
| 10 | | 3320 | | 2050 | 6590 | SS | SAT | Target No. 54. |
| 10 | | 3330 | | 2060 | 6600 | SS | SAT | Target No. 55. |
| 10 | XM196 | 3280 | 008651 | 2010 | 6610 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 3290 | | 2020 | 6620 | SS | SAT | Target No. 56. |
| 10 | | 3300 | | 2030 | 6630 | SS | SAT | Target No. 57. |
| 10 | | 3310 | | 2040 | 6640 | SS | SAT | Target No. 58. |
| 10 | | 3320 | | 2050 | 6650 | SS | SAT | Target No. 59. |
| 10 | | 3330 | | 2060 | 6660 | SS | SAT | Target No. 60. |
| 40 | XM196 | 3370 | 007239 | 2100 | 6700 | S | SAT | |
| 100 | | 3470 | | 2200 | 6800 | A | SAT | |
| 40 | M193 | 3370 | 007721 | 2100 | 6840 | S | 2-F2R | |
| 100 | | 3470 | | 2200 | 6940 | A | SAT | |

| No. Rds Fired | Type of Ctg | No. of Ctg Type Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|--------------------------------|------------------------|--------------------|-----------------------|--------------------|-------|---------|
| 40 | XM196 | 3510 | 008651 | 2100 | 6980 | S | SAT | |
| 100 | M193 | 3570 | | 2200 | 7080 | A | SAT | |

Date Fired: 17 August 1964.

| | | | | | | | | |
|-----|-------|------|--------|------|------|---|--------|-----------------------|
| 100 | XM196 | 3610 | 007239 | 2300 | 7180 | S | SAT | |
| 100 | M193 | 3670 | 007721 | 2300 | 7280 | S | 12-F2R | |
| 100 | XM196 | 3710 | 008651 | 2300 | 7380 | S | SAT | |
| 100 | XM196 | 3810 | 007239 | 2400 | 7480 | A | SAT | |
| 100 | M193 | 3770 | 007721 | 2400 | 7580 | A | SAT | |
| 100 | M193 | 3870 | 008651 | 2400 | 7680 | A | SAT | |
| 100 | XM196 | 3910 | 007239 | 2500 | 7780 | S | SAT | |
| 100 | M193 | 3970 | 007721 | 2500 | 7880 | S | 3-F2R | |
| 100 | XM196 | 4010 | 008651 | 2500 | 7980 | S | SAT | |
| 100 | XM196 | 4110 | 007239 | 2600 | 8080 | A | SAT | |
| 100 | M193 | 4070 | 007721 | 2600 | 8180 | A | SAT | |
| 100 | M193 | 4170 | 008651 | 2600 | 8280 | A | SAT | |
| 100 | XM196 | 4210 | 007239 | 2700 | 8380 | S | SAT | |
| 100 | M193 | 4270 | 007721 | 2700 | 8480 | S | 5-F2R | |
| 100 | XM196 | 4310 | 008651 | 2700 | 8580 | S | 1-DF | |
| 100 | XM196 | 4410 | 007239 | 2800 | 8680 | A | 1-FFR | Light blow on primer. |
| 100 | M193 | 4370 | 007721 | 2800 | 8780 | A | SAT | |
| 100 | M193 | 4470 | 008651 | 2800 | 8880 | A | SAT | |
| 100 | XM196 | 4510 | 007239 | 2900 | 8980 | S | SAT | |
| 100 | M193 | 4570 | 007721 | 2900 | 9080 | S | 4-F2R | |
| 100 | XM196 | 4610 | 008651 | 2900 | 9180 | S | SAT | |
| 100 | XM196 | 4710 | 007239 | 3000 | 9280 | A | SAT | |
| 100 | M193 | 4670 | 007721 | 3000 | 9380 | A | SAT | |
| 100 | M193 | 4770 | 008651 | 3000 | 9480 | A | SAT | |

Weapons were disassembled, cleaned, inspected, lubricated, and reassembled.

| | | | | | | | | |
|-----|-------|------|--------|------|-------|---|--------|-----------------------|
| 100 | XM196 | 4810 | 007239 | 3100 | 9580 | A | SAT | |
| 100 | M193 | 4870 | 007721 | 3100 | 9680 | A | SAT | |
| 100 | XM196 | 4910 | 008651 | 3100 | 9780 | A | SAT | |
| 100 | XM196 | 5010 | 007239 | 3200 | 9880 | S | SAT | |
| 100 | M193 | 4970 | 007721 | 3200 | 9980 | S | 17-F2R | One primer punch out. |
| 100 | M193 | 5070 | 008651 | 3200 | 10080 | S | SAT | |
| 100 | XM196 | 5110 | 007239 | 3300 | 10180 | A | SAT | |
| 100 | M193 | 5170 | 007721 | 3300 | 10280 | A | SAT | |
| 100 | XM196 | 5210 | 008651 | 3300 | 10380 | A | SAT | |
| 100 | XM196 | 5310 | 007239 | 3400 | 10480 | S | SAT | |
| 100 | M193 | 4270 | 007721 | 3400 | 10580 | S | SAT | |
| 100 | M193 | 5370 | 008651 | 3400 | 10680 | S | SAT | |

| No. Rds Fired | Type of Ctg | No. of Ctg Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Func | Remarks |
|---------------------|-------------------|------------------------|------------------------|--------------------|-----------------------|--------------------|------|---------|
| 100 | XM196 | 5410 | 007239 | 3500 | 10780 | A | SAT | |
| 100 | M193 | 5470 | 007721 | 3500 | 10880 | A | SAT | |
| 100 | XM196 | 5510 | 008651 | 3500 | 10980 | A | SAT | |

Date Fired: 18 August 1964.

| | | | | | | | | |
|-----|-------|------|--------|------|-------|---|-------|-------------------------|
| 100 | XM196 | 5610 | 007239 | 3600 | 11080 | S | SAT | |
| 100 | M193 | 5570 | 007721 | 3600 | 11180 | S | 7-F2R | |
| 100 | M193 | 5670 | 008651 | 3600 | 11280 | S | SAT | |
| 100 | XM196 | 5710 | 007239 | 3700 | 11380 | A | SAT | |
| 100 | M193 | 5770 | 007721 | 3700 | 11480 | A | SAT | |
| 100 | XM196 | 5810 | 008651 | 3700 | 11580 | A | SAT | |
| 100 | XM196 | 5910 | 007239 | 3800 | 11680 | S | SAT | |
| 100 | M193 | 5870 | 007721 | 3800 | 11780 | S | 2-F2R | |
| 100 | M193 | 5970 | 008651 | 3800 | 11880 | S | SAT | |
| 100 | XM196 | 6010 | 007239 | 3900 | 11980 | A | 3-FFR | Light blows on primers. |
| 100 | M193 | 6070 | 007721 | 3900 | 12080 | A | SAT | |
| 100 | XM196 | 6110 | 008651 | 3900 | 12180 | A | 1-DF | |
| 100 | XM196 | 6210 | 007239 | 4000 | 12280 | S | SAT | |
| 100 | M193 | 6170 | 007721 | 4000 | 12380 | S | 1-F2R | |
| 100 | M193 | 6270 | 008651 | 4000 | 12480 | S | SAT | |

Weapons were disassembled, cleaned, inspected, lubricated, and reassembled. Barrels were star-gaged after firing 4000 rounds through each.

Date Fired: 18 August 1964.

| | | | | | | | | |
|----|-------|------|--------|------|-------|----|-----|-------------------------------|
| 10 | XM196 | 6220 | 007239 | 4010 | 12490 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 6230 | | 4020 | 12500 | SS | SAT | Target No. 61. |
| 10 | | 624 | | 4030 | 12510 | SS | SAT | Target No. 62. |
| 10 | | 625 | | 4040 | 12520 | SS | SAT | Target No. 63. |
| 10 | | 626 | | 4050 | 12530 | SS | SAT | Target No. 64. |
| 10 | | 6270 | | 4060 | 12540 | SS | SAT | Target No. 65. |
| 10 | M193 | 6280 | 007721 | 4010 | 12550 | SS | SAT | Settling and locating rounds. |
| 10 | M193 | 6290 | | 4020 | 12560 | SS | SAT | Target No. 66. |
| 10 | | 6300 | | 4030 | 12570 | SS | SAT | Target No. 67. |
| 10 | | 6310 | | 4040 | 12580 | SS | SAT | Target No. 68. |
| 10 | | 6320 | | 4050 | 12590 | SS | SAT | Target No. 69. |
| 10 | | 6330 | | 4060 | 12600 | SS | SAT | Target No. 70. |
| 10 | XM196 | 6280 | 008651 | 4010 | 12610 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 6290 | | 4020 | 12620 | SS | SAT | Target No. 71. |
| 10 | | 6300 | | 4030 | 12630 | SS | SAT | Target No. 72. |

| No. Rds Fired | Type of Ctg | No. of Ctg Type Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|--------------------------------|------------------------|--------------------|-----------------------|--------------------|-------|------------------------|
| 10 | | 6310 | | 4040 | 12640 | SS | SAT | Target No. 73. |
| 10 | | 6320 | | 4050 | 12650 | SS | SAT | Target No. 74. |
| 10 | | 6330 | | 4060 | 12660 | SS | SAT | Target No. 75. |
| 40 | XM196 | 6370 | 007239 | 4100 | 12700 | S | SAT | |
| 100 | | 6470 | | 4200 | 12800 | A | 1-DF | |
| 40 | M193 | 6370 | 007721 | 4100 | 12840 | S | 3-F2R | |
| 100 | | 6470 | | 4200 | 12940 | A | SAT | |
| 40 | XM196 | 6510 | 008651 | 4100 | 12980 | S | SAT | |
| 100 | M193 | 6570 | | 4200 | 13080 | A | SAT | |
| 100 | XM196 | 6610 | 007239 | 4300 | 13180 | S | SAT | |
| 100 | M193 | 6670 | 007721 | 4300 | 13280 | S | 2-F2R | |
| 100 | XM196 | 6710 | 008651 | 4300 | 13380 | S | SAT | |
| 100 | XM196 | 6810 | 007239 | 4400 | 13480 | A | SAT | |
| 100 | M193 | 6770 | 007721 | 4400 | 13580 | A | SAT | |
| 100 | M193 | 6870 | 008651 | 4400 | 13680 | A | SAT | |
| 100 | XM196 | 6910 | 007239 | 4500 | 13780 | S | SAT | |
| 100 | M193 | 6970 | 007721 | 4500 | 13880 | S | 2-F2R | |
| 100 | XM196 | 7010 | 008651 | 4500 | 13980 | S | SAT | |
| 100 | XM196 | 7110 | 007239 | 4600 | 14080 | A | SAT | |
| 100 | M193 | 7070 | 007721 | 4600 | 14180 | A | SAT | |
| 100 | M193 | 7170 | 008651 | 4600 | 14280 | A | SAT | |
| 100 | XM196 | 7210 | 007239 | 4700 | 14380 | S | SAT | |
| 100 | M193 | 7270 | 007721 | 4700 | 14480 | S | 4-F2R | |
| 100 | XM196 | 7310 | 008651 | 4700 | 14580 | S | SAT | |
| 100 | XM196 | 7410 | 007239 | 4800 | 14680 | A | SAT | |
| 100 | M193 | 7370 | 007721 | 4800 | 14780 | A | 1-FFR | Light blows on primer. |
| 100 | M193 | 7470 | 008651 | 4800 | 14880 | A | SAT | |

Date Fired: 20 August 1964.

| | | | | | | | |
|-----|-------|------|--------|------|-------|---|-------|
| 100 | XM196 | 7510 | 007239 | 4900 | 14980 | S | SAT |
| 100 | M193 | 7570 | 007721 | 4900 | 15080 | S | 2-F2R |
| 100 | XM196 | 7610 | 008651 | 4900 | 15180 | S | SAT |
| 100 | XM196 | 7710 | 007239 | 5000 | 15280 | A | SAT |
| 100 | M193 | 7670 | 007721 | 5000 | 15380 | A | SAT |
| 100 | M193 | 7770 | 008651 | 5000 | 15480 | A | SAT |

Weapons were disassembled, cleaned, inspected, lubricated, and reassembled.

| | | | | | | | |
|-----|-------|------|--------|------|-------|---|-------|
| 100 | XM196 | 7810 | 007239 | 5100 | 15580 | A | SAT |
| 100 | M193 | 7870 | 007721 | 5100 | 15680 | A | SAT |
| 100 | XM196 | 7910 | 008651 | 5100 | 15780 | A | SAT |
| 100 | XM196 | 8010 | 007239 | 5200 | 15880 | S | SAT |
| 100 | M193 | 7970 | 007721 | 5200 | 15980 | S | 1-F2R |
| 100 | M193 | 8070 | 008651 | 5200 | 16080 | S | SAT |

| No. Rds Fired | Type of Ctg | No. of Ctg Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|------------------------|------------------------|--------------------|-----------------------|--------------------|---------------|-------------------------------|
| 100 | XM196 | 8110 | 007239 | 5300 | 16180 | A | SAT | |
| 100 | M193 | 8170 | 007721 | 5300 | 16280 | A | 1-FFR | Light blows on primer. |
| 100 | XM196 | 8210 | 008651 | 5300 | 16380 | A | SAT | |
| 100 | XM196 | 8310 | 007239 | 5400 | 16480 | S | SAT | |
| 100 | M193 | 8270 | 007721 | 5400 | 16580 | S | SAT | |
| 100 | M193 | 8370 | 008651 | 5400 | 16680 | S | SAT | |
| 100 | XM196 | 8410 | 007239 | 5500 | 16780 | A | SAT | |
| 100 | M193 | 8470 | 007721 | 5500 | 16880 | A | 1-FX | Replaced broken extractor. |
| 100 | XM196 | 8510 | 008651 | 5500 | 16980 | A | SAT | |
| 100 | XM196 | 8610 | 007239 | 5600 | 17080 | S | SAT | |
| 100 | M193 | 8570 | 007721 | 5600 | 17180 | S | 1-DF 1-FFR | Light blows on primer. |
| 100 | M193 | 8670 | 008651 | 5600 | 17280 | S | SAT | |
| 100 | XM196 | 8710 | 007239 | 5700 | 17380 | A | SAT | |
| 100 | M193 | 8770 | 007721 | 5700 | 17480 | A | SAT | |
| 100 | XM196 | 8810 | 008651 | 5700 | 17580 | A | SAT | |
| 100 | XM196 | 8910 | 007239 | 5800 | 17680 | S | SAT | |
| 100 | M193 | 8870 | 007721 | 5800 | 17780 | S | SAT | |
| 100 | M193 | 8970 | 008651 | 5800 | 17880 | S | SAT | |
| 100 | XM196 | 9010 | 007239 | 5900 | 17980 | A | SAT | |
| 100 | M193 | 9070 | 007721 | 5900 | 18080 | A | SAT | |
| 100 | M193 | 9170 | 008651 | 5900 | 18180 | A | SAT | |
| 40 | XM196 | 9050 | 007239 | 5940 | 18220 | S | SAT | |
| 40 | M193 | 9210 | 007721 | 5940 | 18260 | S | SAT | |
| 40 | XM196 | 9090 | 008651 | 5940 | 18300 | S | SAT | |

Date Fired: 21 August 1964.

| | | | | | | | | |
|----|-------|------|--------|------|-------|----|-----|----------------------------------|
| 10 | XM196 | 9100 | 007239 | 5950 | 18310 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 9110 | | 5960 | 18320 | SS | SAT | Target No. 76. |
| 10 | | 9120 | | 5970 | 18330 | SS | SAT | Target No. 77. |
| 10 | | 9130 | | 5980 | 18340 | SS | SAT | Target No. 78. |
| 10 | | 9140 | | 5990 | 18350 | SS | SAT | Target No. 79. |
| 10 | | 9150 | | 6000 | 18360 | SS | SAT | Target No. 80. |
| 10 | M193 | 9220 | 007721 | 5950 | 18370 | SS | SAT | Settling and locating rounds. |
| 10 | M193 | 9230 | | 5960 | 18380 | SS | SAT | Target No. 81. |
| 10 | | 9240 | | 5970 | 18390 | SS | SAT | Target No. 82. |
| 10 | | 9250 | | 5980 | 18400 | SS | SAT | Target No. 83. |
| 10 | | 9260 | | 5990 | 18410 | SS | SAT | Target No. 84. |
| 10 | | 9270 | | 6000 | 18420 | SS | SAT | Target No. 85. |

| No. Rds Fired | Type of Ctg | No. of Ctg Type Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---------------------|-------------------|--------------------------------|------------------------|--------------------|-----------------------|--------------------|-------|-------------------------------|
| 10 | XM196 | 9160 | 008651 | 5950 | 18430 | SS | SAT | Settling and locating rounds. |
| 10 | XM196 | 9170 | | 5960 | 18440 | SS | SAT | Target No. 86. |
| 10 | | 9180 | | 5970 | 18450 | SS | SAT | Target No. 87. |
| 10 | | 9190 | | 5980 | 18460 | SS | SAT | Target No. 88. |
| 10 | | 9200 | | 5990 | 18470 | SS | SAT | Target No. 89. |
| 10 | | 9210 | | 6000 | 18480 | SS | SAT | Target No. 90. |

Weapons were disassembled, cleaned, inspected, lubricated, and reassembled. Barrels were star-gaged after firing 6000 rounds through each.

Phase 2.5, Vibration

Date Fired: 25 August 1964.

| | | | | | | | | |
|-----|-------|-------|--------|------|-------|---|--------|---|
| 100 | XM196 | 9310 | 007239 | 6100 | 18580 | A | 3-FFR | Fired from ten magazines. Light blows on primers. |
| 100 | | 9410 | 007721 | 6100 | 18680 | A | SAT | |
| 100 | | 9510 | 008651 | 6100 | 18780 | A | SAT | |
| 100 | | 9610 | 007239 | 6200 | 18880 | A | 3-FFR | Light blows on primers. |
| 100 | | 9710 | 007721 | 6200 | 18980 | A | 7-FFR | Light blows on primers. |
| 100 | | 9810 | 008651 | 6200 | 19080 | A | SAT | |
| 100 | | 9910 | 007239 | 6300 | 19180 | A | 2-FFR | Light blows on primers. |
| 100 | | 10010 | 007721 | 6300 | 19280 | A | 20-FFR | Light blows on primers. |
| 100 | | 10110 | 008651 | 6300 | 19380 | A | SAT | |
| 100 | | 10210 | 007239 | 6400 | 19480 | A | 1-FFR | Light blows on primers. |

Visual examination of the cartridge revealed that the points of the projectiles were slightly flattened and the red identification lacquer was chipped off the projectile tips only. This insignificant damage was caused by the projectile points impacting against the inside of the magazine.

Phase 2.4, Cook-Off

Date Fired: 25 August 1964.

| | | | | | | | |
|-----|-------|-------|--------|------|-------|---|-------|
| 6 | XM196 | 10216 | 008651 | 6306 | 19486 | A | 1-FFR |
| 120 | | 10336 | 007239 | 6520 | 19606 | A | SAT |

Fired 119 rounds in 68.9 seconds. No cook-off occurred in 10 minutes.

| No. Rds Fired | Type of Ctg | No. of Ctg Fired | Rifle Serial No. | Rifle Rd No. | Total Rds Fired | Type of Fire | Funct | Remarks |
|---|-------------------|------------------------|------------------------|--------------------|-----------------------|--------------------|-------|------------------------|
| 141 | | 10477 | 008651 | 6447 | 19747 | A | SAT | |
| Fired 141 rounds in 72.4 seconds. Fired cook-off round erroneously. | | | | | | | | |
| 141 | | 10618 | 008651 | 6588 | 19888 | A | SAT | |
| Fired 140 rounds in 69.3 seconds. No cook-off occurred in 10 minutes. | | | | | | | | |
| 141 | | 10759 | 007239 | 6661 | 20029 | A | SAT | |
| Fired 140 rounds in 44.0 seconds. Cook-off occurred in 30.7 seconds. | | | | | | | | |
| 121 | | 10880 | 008651 | 6709 | 20150 | A | SAT | |
| Fired 120 rounds in 36.8 seconds. No cook-off occurred in 10 minutes. | | | | | | | | |
| 121 | | 11001 | 007239 | 6782 | 20271 | A | SAT | |
| Fired 120 rounds in 34.1 seconds. No cook-off occurred in 10 minutes. | | | | | | | | |
| 141 | | 11142 | 008651 | 6850 | 20412 | A | SAT | |
| Fired 140 rounds in 47.1 seconds. Cook-off occurred in 36.3 seconds. | | | | | | | | |
| Date Fired: 26 August 1964. | | | | | | | | |
| 141 | M193 | 9411 | 007239 | 6923 | 20553 | A | SAT | Five-stretched cases. |
| Fired 140 rounds in 46.7 seconds. Cook-off occurred in 41.2 seconds. | | | | | | | | |
| 5 | | 9416 | 008651 | 6855 | 20558 | A | FCB | |
| Fired automatically on closing bolt. | | | | | | | | |
| 121 | | 9537 | 007239 | 7044 | 20679 | A | SAT | Three-stretched cases. |
| Fired 120 rounds in 36.3 seconds. No cook-off occurred in 10 minutes. | | | | | | | | |
| 121 | M193 | 9658 | 008651 | 6976 | 20800 | A | SAT | Five-stretched cases. |
| Fired 120 rounds in 31.9 seconds. No cook-off occurred in 10 minutes. | | | | | | | | |
| 141 | | 9799 | 007239 | 7185 | 20941 | A | SAT | Two-stretched cases. |
| Fired 140 rounds in 51.2 seconds. Cook-off occurred in 42.7 seconds. | | | | | | | | |
| A cook-off will probably occur with both the XM196 tracer and M193 ball cartridges if more than 120 rounds are fired rapidly. | | | | | | | | |

Brush Deflection Data

Date: 30 September 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 1.
 Velocity at 25 Feet, fps: 2857.
 Velocity at 55 Feet, fps: 2829.
 Bullet Hole in Peg: Vertical -
 Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|-----|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | a 3.5 in. | -0.5 | 0.7 | | |
| 2 | 3 in. | -0.5 | 0.8 | | |
| 3 | 1 ft | -0.3 | 0.8 | | |
| 4 | 2 ft | -0.4 | 0.7 | 0.3 | 210 |
| 5 | 3 ft | -0.4 | 0.7 | 0.3 | 241 |
| 6 | 4 ft | -0.4 | 0.8 | 0.4 | 268 |
| 7 | 5 ft | -0.3 | 0.8 | 0.4 | 297 |
| 8 | 6 ft | -0.4 | 0.8 | 0.4 | 322 |
| 9 | 7 ft | -0.3 | 0.8 | 0.4 | 344 |
| 10 | 8 ft | -0.3 | 0.9 | 0.4 | 7 |
| 11 | 9 ft | -0.5 | 0.9 | | |
| 12 | 10 ft | -0.4 | 0.9 | | |
| 13 | 11 ft | -0.4 | 0.9 | | |
| 14 | 12 ft | -0.4 | 0.9 | | |
| 15 | 13 ft | -0.4 | 0.9 | | |
| 16 | 14 ft | -0.3 | 0.9 | | |
| 17 | 15 ft | -0.3 | 0.8 | | |
| 18 | 16 ft | -0.3 | 0.9 | | |
| 19 | 17 ft | -0.4 | 0.8 | | |
| 20 | 18 ft | -0.1 | 0.8 | | |
| 21 | 19 ft | -0.1 | 0.8 | | |
| 22 | 20 ft | -0.1 | 0.7 | | |
| 23 | 40 ft | -0.9 | 1.1 | | |
| 24 | 60 ft | 1.2 | 2.0 | | |
| 25 | 80 ft | 1.1 | 3.7 | | |
| 26 | 100 ft | 2.1 | 1.9 | | |
| 27 | 120 ft | 2.5 | 3.0 | | |
| 28 | 140 ft | 2.6 | 3.4 | | |
| 29 | 160 ft | 3.1 | 3.5 | | |
| 30 | 180 ft | 3.6 | 4.0 | | |
| 31 | 200 ft | 3.9 | 4.7 | | |
| 32 | 225 ft | 3.4 | 4.2 | | |

aIn front of peg.

bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 30 September 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 2.
 Velocity at 25 Feet, fps: 2865.
 Velocity at 55 Feet, fps: 2837.
 Bullet Hole in Peg: Vertical -
 Horizontal -

| Target No. | Distance Peg to Target | | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|-----|------------------------------|------|---------------------------|--------------------------------|
| | | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 | in. | -0.6 | -1.3 | | |
| 2 | 3 | in. | -0.6 | -1.2 | | |
| 3 | 1 | ft | -0.5 | -1.2 | | |
| 4 | 2 | ft | -0.5 | -1.2 | | |
| 5 | 3 | ft | -0.4 | -1.1 | 0.3 | 55 |
| 6 | 4 | ft | -0.4 | -1.0 | 0.3 | 68 |
| 7 | 5 | ft | -0.5 | -1.0 | 0.3 | 91 |
| 8 | 6 | ft | -0.6 | -1.0 | 0.4 | 123 |
| 9 | 7 | ft | -0.7 | -1.1 | 0.4 | 136 |
| 10 | 8 | ft | -0.7 | -1.2 | 0.4 | 153 |
| 11 | 9 | ft | -0.6 | -1.3 | | |
| 12 | 10 | ft | -0.6 | -1.4 | | |
| 13 | 11 | ft | -0.5 | -1.4 | | |
| 14 | 12 | ft | -0.5 | -1.4 | | |
| 15 | 13 | ft | -0.4 | -1.4 | | |
| 16 | 14 | ft | -0.4 | -1.4 | | |
| 17 | 15 | ft | -0.3 | -1.5 | | |
| 18 | 16 | ft | -0.4 | -1.4 | 0.3 | 139 |
| 19 | 17 | ft | -0.5 | -1.6 | 0.4 | 170 |
| 20 | 18 | ft | -0.5 | -1.7 | 0.4 | 185 |
| 21 | 19 | ft | -0.4 | -1.8 | 0.4 | 206 |
| 22 | 20 | ft | -0.4 | -1.9 | 0.4 | 237 |
| 23 | 40 | ft | 0.8 | -2.4 | 0.3 | 305 |
| 24 | 60 | ft | 1.3 | -1.8 | | |
| 25 | 80 | ft | 1.2 | -0.5 | | |
| 26 | 100 | ft | 2.1 | -2.9 | | |
| 27 | 120 | ft | 2.6 | -2.5 | | |
| 28 | 140 | ft | 2.8 | -2.6 | | |
| 29 | 160 | ft | 3.4 | -2.9 | | |
| 30 | 180 | ft | 4.0 | -3.1 | | |
| 31 | 200 | ft | 4.3 | -2.8 | | |
| 32 | 225 | ft | 3.8 | -4.0 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 30 September 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 3.
 Velocity at 25 Feet, fps: 2841.
 Velocity at 55 Feet, fps: 2813.
 Bullet Hole in Peg: Vertical -
 Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.0 | -0.8 | | |
| 2 | 3 in. | -2.0 | -0.8 | | |
| 3 | 1 ft | -1.9 | -0.7 | | |
| 4 | 2 ft | -1.9 | -0.7 | | |
| 5 | 3 ft | -1.8 | -0.7 | | |
| 6 | 4 ft | -1.8 | -0.7 | | |
| 7 | 5 ft | -2.0 | -0.7 | | |
| 8 | 6 ft | -2.0 | -0.6 | | |
| 9 | 7 ft | -2.0 | -0.8 | | |
| 10 | 8 ft | -2.0 | -0.8 | | |
| 11 | 9 ft | -2.0 | -0.8 | | |
| 12 | 10 ft | -2.0 | -0.8 | | |
| 13 | 11 ft | -2.0 | -0.8 | | |
| 14 | 12 ft | -2.0 | -0.8 | | |
| 15 | 13 ft | -1.9 | -0.8 | | |
| 16 | 14 ft | -1.9 | -0.9 | | |
| 17 | 15 ft | -1.9 | -0.9 | | |
| 18 | 16 ft | -1.9 | -0.9 | | |
| 19 | 17 ft | -1.9 | -1.0 | | |
| 20 | 18 ft | -1.9 | -0.9 | | |
| 21 | 19 ft | -1.9 | -1.0 | | |
| 22 | 20 ft | -1.9 | -1.0 | | |
| 23 | 40 ft | -1.5 | -1.2 | | |
| 24 | 60 ft | -1.6 | -0.8 | | |
| 25 | 80 ft | -2.0 | -0.5 | | |
| 26 | 100 ft | -1.5 | -1.6 | | |
| 27 | 120 ft | -1.6 | -1.2 | | |
| 28 | 140 ft | -1.8 | -1.4 | | |
| 29 | 160 ft | -1.6 | -1.5 | | |
| 30 | 180 ft | -1.6 | -1.5 | | |
| 31 | 200 ft | -1.8 | -1.4 | | |
| 32 | 225 ft | -2.7 | -2.4 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 30 September 1964.

Weapon No.: M14, serial No. 1563467.

Cartridge: 7.62-mm, M62.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 4.

Velocity at 25 Feet, fps: 2857.

Velocity at 55 Feet, fps: 2833.

Bullet Hole in Peg: Vertical -
Horizontal -

| Target No. | Distance Peg to Target | | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|-----|------------------------------|------|---------------------------|--------------------------------|
| | | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 | in. | 0 | -0.9 | | |
| 2 | 3 | in. | 0.1 | -0.8 | 0.3 | 21 |
| 3 | 1 | ft | 0.3 | -0.7 | 0.4 | 36 |
| 4 | 2 | ft | 0.3 | -0.6 | 0.4 | 52 |
| 5 | 3 | ft | 0.1 | -0.5 | 0.4 | 78 |
| 6 | 4 | ft | 0 | -0.5 | 0.4 | 105 |
| 7 | 5 | ft | -0.1 | -0.5 | 0.4 | 127 |
| 8 | 6 | ft | -0.2 | -0.7 | 0.4 | 156 |
| 9 | 7 | ft | 0 | -0.8 | | |
| 10 | 8 | ft | 0 | -0.8 | | |
| 11 | 9 | ft | 0 | -0.8 | | |
| 12 | 10 | ft | 0.1 | -0.8 | | |
| 13 | 11 | ft | 0 | -0.8 | | |
| 14 | 12 | ft | 0.1 | -0.6 | 0.3 | 90 |
| 15 | 13 | ft | 0.1 | -0.6 | 0.4 | 105 |
| 16 | 14 | ft | -0.1 | -0.7 | 0.4 | 133 |
| 17 | 15 | ft | 0 | -0.8 | 0.4 | 154 |
| 18 | 16 | ft | 0 | -1.0 | 0.4 | 181 |
| 19 | 17 | ft | 0 | -1.1 | 0.4 | 209 |
| 20 | 18 | ft | 0.2 | -1.0 | | |
| 21 | 19 | ft | 0.2 | -1.1 | | |
| 22 | 20 | ft | 0.2 | -1.1 | | |
| 23 | 40 | ft | 1.1 | -1.6 | | |
| 24 | 60 | ft | 1.9 | -1.4 | | |
| 25 | 80 | ft | 2.0 | 0.1 | | |
| 26 | 100 | ft | 2.9 | -2.2 | | |
| 27 | 120 | ft | 3.5 | -1.8 | | |
| 28 | 140 | ft | 3.8 | -2.0 | | |
| 29 | 160 | ft | 4.4 | -2.2 | | |
| 30 | 180 | ft | 5.1 | -2.5 | | |
| 31 | 200 | ft | 5.6 | -2.2 | | |
| 32 | 225 | ft | 5.1 | -3.3 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 30 September 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 5.
 Velocity at 25 Feet, fps: 2857.
 Velocity at 55 Feet, fps: 2833.
 Bullet Hole in Peg: Vertical -
 Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|-----|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -1.4 | 0.8 | | |
| 2 | 3 in. | -1.3 | 0.9 | | |
| 3 | 1 ft | -1.2 | 0.9 | | |
| 4 | 2 ft | -1.2 | 0.9 | | |
| 5 | 3 ft | -1.2 | 0.9 | | |
| 6 | 4 ft | -1.2 | 0.9 | | |
| 7 | 5 ft | -1.3 | 1.0 | | |
| 8 | 6 ft | -1.3 | 1.0 | | |
| 9 | 7 ft | -1.3 | 0.9 | | |
| 10 | 8 ft | -1.3 | 0.9 | | |
| 11 | 9 ft | -1.3 | 0.9 | | |
| 12 | 10 ft | -1.3 | 0.9 | | |
| 13 | 11 ft | -1.3 | 0.9 | | |
| 14 | 12 ft | -1.2 | 0.9 | | |
| 15 | 13 ft | -1.2 | 1.0 | | |
| 16 | 14 ft | -1.1 | 1.0 | | |
| 17 | 15 ft | -1.0 | 1.0 | | |
| 18 | 16 ft | -1.0 | 1.0 | | |
| 19 | 17 ft | -1.0 | 0.9 | | |
| 20 | 18 ft | -1.0 | 1.0 | | |
| 21 | 19 ft | -1.0 | 1.0 | | |
| 22 | 20 ft | -1.0 | 0.9 | | |
| 23 | 40 ft | -0.7 | 1.4 | | |
| 24 | 60 ft | -0.7 | 1.9 | | |
| 25 | 80 ft | -0.8 | 3.6 | | |
| 26 | 100 ft | -0.3 | 2.1 | | |
| 27 | 120 ft | -0.5 | 2.9 | | |
| 28 | 140 ft | -0.6 | 3.0 | | |
| 29 | 160 ft | -0.3 | 3.4 | | |
| 30 | 180 ft | -0.3 | 3.7 | | |
| 31 | 200 ft | -0.3 | 4.2 | | |
| 32 | 225 ft | -1.1 | 3.8 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 30 September 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 6.
 Velocity at 25 Feet, fps: 2845.
 Velocity at 55 Feet, fps: 2825.
 Bullet Hole in Peg: Vertical - +2.90.
 Horizontal - +0.10.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|-------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | a 3.5 in. | -2.7 | 0 | | |
| 2 | 3 in. | -2.7 | 0 | | |
| 3 | 1 ft | -2.4 | 0.2 | 0.4 | 75 |
| 4 | 2 ft | -2.4 | 0.3 | 0.4 | 106 |
| 5 | 3 ft | -2.5 | 0.3 | 0.5 | 130 |
| 6 | 4 ft | -2.5 | 0.3 | 0.6 | 154 |
| 7 | 5 ft | -2.5 | 0.3 | 0.6 | 179 |
| 8 | 6 ft | -2.5 | 0.3 | 0.5 | 202 |
| 9 | 7 ft | -2.4 | 0.3 | 0.4 | 228 |
| 10 | 8 ft | -2.3 | 0.3 | 0.3 | 250 |
| 11 | 9 ft | -2.2 | 0.5 | | |
| 12 | 10 ft | -2.2 | 0.5 | | |
| 13 | 11 ft | -2.3 | 0.6 | | |
| 14 | 12 ft | -2.3 | 0.8 | 0.4 | 143 |
| 15 | 13 ft | -2.4 | 0.8 | 0.5 | 167 |
| 16 | 14 ft | -2.4 | 0.7 | 0.5 | 192 |
| 17 | 15 ft | -2.3 | 0.6 | 0.5 | 214 |
| 18 | 16 ft | -2.3 | 0.6 | 0.5 | 237 |
| 19 | 17 ft | -2.4 | 0.7 | 0.4 | 263 |
| 20 | 18 ft | -2.4 | 0.9 | | |
| 21 | 19 ft | -2.4 | 0.9 | | |
| 22 | 20 ft | -2.5 | 0.9 | | |
| 23 | 40 ft | -4.0 | 0.1 | | |
| 24 | 60 ft | -4.7 | - 1.6 | | |
| 25 | 80 ft | -4.5 | - 1.6 | | |
| 26 | 100 ft | -3.9 | - 3.8 | | |
| 27 | 120 ft | -4.8 | - 3.9 | | |
| 28 | 140 ft | -5.6 | - 5.3 | | |
| 29 | 160 ft | -5.4 | - 6.6 | | |
| 30 | 180 ft | -5.4 | - 7.3 | | |
| 31 | 200 ft | -6.1 | - 7.8 | | |
| 32 | 225 ft | -7.6 | -10.3 | | |

aIn front of peg.

bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 30 September 1964.

Weapon No.: M14, serial No. 1563467.

Cartridge: 7.62-mm, M62.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 7.

Velocity at 25 Feet, fps: 2853.

Velocity at 55 Feet, fps: 2825.

Bullet Hole in Peg: Vertical - +4.60.

Horizontal - +0.20.

| Target No. | Distance Peg to Target | | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|---------|------------------------------|-------|---------------------------|--------------------------------|
| | | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a | 3.5 in. | - 0.9 | - 0.1 | | |
| 2 | | 3 in. | - 0.9 | - 0.1 | | |
| 3 | | 1 ft | - 0.7 | - 0.3 | 0.4 | 292 |
| 4 | | 2 ft | - 0.6 | - 0.4 | 0.6 | 311 |
| 5 | | 3 ft | - 0.4 | - 0.5 | 0.8 | 330 |
| 6 | | 4 ft | - 0.2 | - 0.4 | 0.9 | 352 |
| 7 | | 5 ft | - 0.2 | - 0.4 | 0.9 | 17 |
| 8 | | 6 ft | - 0.1 | - 0.3 | 0.8 | 38 |
| 9 | | 7 ft | - 0.1 | - 0.4 | 0.7 | 60 |
| 10 | | 8 ft | - 0.1 | - 0.6 | 0.4 | 78 |
| 11 | | 9 ft | 0 | - 0.8 | | |
| 12 | | 10 ft | 0.3 | - 0.9 | 0.4 | 315 |
| 13 | | 11 ft | 0.6 | - 1.0 | 0.6 | 334 |
| 14 | | 12 ft | 0.9 | - 1.0 | 0.8 | 355 |
| 15 | | 13 ft | 1.2 | - 0.9 | 0.8 | 18 |
| 16 | | 14 ft | 1.4 | - 0.8 | 0.9 | 43 |
| 17 | | 15 ft | 1.6 | - 0.9 | 0.8 | 61 |
| 18 | | 16 ft | 1.8 | - 0.9 | 0.6 | 83 |
| 19 | | 17 ft | 1.9 | - 1.1 | 0.4 | 103 |
| 20 | | 18 ft | 2.3 | - 1.2 | | |
| 21 | | 19 ft | 2.5 | - 1.2 | | |
| 22 | | 20 ft | 3.1 | - 1.3 | 0.6 | 1 |
| 23 | | 40 ft | 10.1 | 1.3 | 0.8 | 96 |
| 24 | | 60 ft | Missed | | | |
| 25 | | 80 ft | 20.2 | 17.3 | | |
| 26 | | 100 ft | 20.4 | 21.7 | 0.6 | 240 |
| 27 | | 120 ft | 20.9 | 25.5 | 0.6 | 354 |
| 28 | | 140 ft | 23.2 | 28.4 | | |
| 29 | | 160 ft | Missed | | | |
| 30 | | 180 ft | Missed | | | |
| 31 | | 200 ft | Missed | | | |
| 32 | | 225 ft | Missed | | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 30 September 1964.

Weapon No.: M14, serial No. 1563467.

Cartridge: 7.62-mm, M62.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 8.

Velocity at 25 Feet, fps: 2861.

Velocity at 55 Feet, fps: 2841.

Bullet Hole in Peg: Vertical - +2.50.
Horizontal - -0.35.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|-----|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -3.1 | 0.5 | | |
| 2 | 3 in. | -3.0 | 0.5 | | |
| 3 | 1 ft | -2.9 | 0.5 | | |
| 4 | 2 ft | -2.9 | 0.5 | | |
| 5 | 3 ft | -2.9 | 0.6 | | |
| 6 | 4 ft | -2.9 | 0.6 | | |
| 7 | 5 ft | -3.0 | 0.6 | | |
| 8 | 6 ft | -3.0 | 0.6 | | |
| 9 | 7 ft | -3.0 | 0.5 | | |
| 10 | 8 ft | -3.0 | 0.5 | | |
| 11 | 9 ft | -3.0 | 0.5 | | |
| 12 | 10 ft | -3.0 | 0.6 | | |
| 13 | 11 ft | -3.0 | 0.5 | | |
| 14 | 12 ft | -2.9 | 0.7 | | |
| 15 | 13 ft | -2.9 | 0.7 | | |
| 16 | 14 ft | -2.8 | 0.7 | | |
| 17 | 15 ft | -2.8 | 0.8 | | |
| 18 | 16 ft | -2.8 | 0.8 | | |
| 19 | 17 ft | -2.9 | 0.8 | | |
| 20 | 18 ft | -2.8 | 0.8 | | |
| 21 | 19 ft | -2.8 | 0.8 | | |
| 22 | 20 ft | -2.8 | 0.8 | | |
| 23 | 40 ft | -3.3 | 1.5 | | |
| 24 | 60 ft | -3.8 | 1.7 | | |
| 25 | 80 ft | -4.0 | 3.5 | | |
| 26 | 100 ft | -4.0 | 2.3 | | |
| 27 | 120 ft | -4.7 | 3.0 | | |
| 28 | 140 ft | -4.8 | 3.1 | | |
| 29 | 160 ft | -5.0 | 3.7 | | |
| 30 | 180 ft | -5.5 | 4.0 | | |
| 31 | 200 ft | -5.7 | 4.4 | | |
| 32 | 225 ft | -7.0 | 4.3 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 1 October 1964.

Weapon No.: M14, serial No. 1563467.

Cartridge: 7.62-mm, M62.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 9.

Velocity at 25 Feet, fps: 2857.

Velocity at 55 Feet, fps: 2829.

Bullet Hole in Peg: Vertical - +4.75.
Horizontal - +0.15.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|-------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | - 0.8 | - 0.1 | | |
| 2 | 3 in. | - 0.8 | 0 | | |
| 3 | 1 ft | - 0.7 | - 0.2 | 0.4 | 297 |
| 4 | 2 ft | - 0.5 | - 0.3 | 0.6 | 313 |
| 5 | 3 ft | - 0.4 | - 0.3 | 0.7 | 337 |
| 6 | 4 ft | - 0.3 | - 0.2 | 0.8 | 2 |
| 7 | 5 ft | - 0.2 | - 0.2 | 0.8 | 25 |
| 8 | 6 ft | - 0.3 | - 0.1 | 0.8 | 49 |
| 9 | 7 ft | - 0.3 | - 0.2 | 0.6 | 70 |
| 10 | 8 ft | - 0.3 | - 0.4 | 0.4 | 90 |
| 11 | 9 ft | - 0.2 | - 0.5 | | |
| 12 | 10 ft | 0 | - 0.6 | 0.3 | 322 |
| 13 | 11 ft | 0.2 | - 0.6 | 0.5 | 341 |
| 14 | 12 ft | 0.5 | - 0.5 | 0.7 | 2 |
| 15 | 13 ft | 0.7 | - 0.4 | 0.8 | 27 |
| 16 | 14 ft | 0.8 | - 0.3 | 0.8 | 51 |
| 17 | 15 ft | 0.9 | - 0.3 | 0.7 | 71 |
| 18 | 16 ft | 1.0 | - 0.3 | 0.6 | 94 |
| 19 | 17 ft | 1.0 | - 0.5 | 0.5 | 117 |
| 20 | 18 ft | 1.4 | - 0.5 | | |
| 21 | 19 ft | - 1.5 | - 0.5 | | |
| 22 | 20 ft | - 2.0 | - 0.5 | 0.5 | 6 |
| 23 | 40 ft | 6.5 | 3.0 | 0.7 | 106 |
| 24 | 60 ft | 9.4 | 9.1 | 0.6 | 201 |
| 25 | 80 ft | 9.3 | 17.6 | | |
| 26 | 100 ft | 8.0 | 20.0 | | |
| 27 | 120 ft | 7.8 | 22.6 | 0.5 | 345 |
| 28 | 140 ft | 9.3 | 25.9 | 0.5 | 97 |
| 29 | 160 ft | 10.9 | 30.4 | 0.4 | 210 |
| 30 | 180 ft | 11.4 | 35.2 | | |
| 31 | 200 ft | - | - | | |
| 32 | 225 ft | 11.5 | 41.9 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 1 October 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 10.
 Velocity at 25 Feet, fps: 2857.
 Velocity at 55 Feet, fps: 2833.
 Bullet Hole in Peg: Vertical - +2.25.
 Horizontal - -0.30.

| Target No. | Distance Peg to Target | | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|-----|------------------------------|-------|---------------------------|--------------------------------|
| | | | Vert | Hor | Length ^a , in. | Orientation ^b , deg |
| 1 | ^a 3.5 | in. | - 3.4 | 0.4 | | |
| 2 | 3 | in. | - 3.3 | 0.4 | | |
| 3 | 1 | ft | - 3.1 | 0.7 | 0.5 | 107 |
| 4 | 2 | ft | - 3.3 | 0.9 | 0.7 | 135 |
| 5 | 3 | ft | - 3.5 | 1.0 | 0.8 | 164 |
| 6 | 4 | ft | - 3.5 | 1.0 | 0.9 | 191 |
| 7 | 5 | ft | - 3.5 | 1.1 | 0.8 | 217 |
| 8 | 6 | ft | - 3.4 | 1.2 | 0.7 | 245 |
| 9 | 7 | ft | - 3.3 | 1.4 | 0.5 | 275 |
| 10 | 8 | ft | - 3.4 | 1.7 | | |
| 11 | 9 | ft | - 3.5 | 1.9 | | |
| 12 | 10 | ft | - 3.6 | 2.2 | 0.5 | 135 |
| 13 | 11 | ft | - 3.9 | 2.4 | 0.7 | 163 |
| 14 | 12 | ft | - 4.1 | 2.4 | 0.8 | 190 |
| 15 | 13 | ft | - 4.1 | 2.3 | 0.9 | 217 |
| 16 | 14 | ft | - 4.2 | 2.3 | 0.8 | 245 |
| 17 | 15 | ft | - 4.1 | 2.4 | 0.7 | 270 |
| 18 | 16 | ft | - 4.2 | 2.6 | 0.6 | 298 |
| 19 | 17 | ft | - 4.5 | 2.8 | | |
| 20 | 18 | ft | - 4.6 | 3.0 | | |
| 21 | 19 | ft | - 5.0 | 3.2 | 0.5 | 159 |
| 22 | 20 | ft | - 5.3 | 3.1 | 0.7 | 189 |
| 23 | 40 | ft | - 9.5 | 1.6 | 0.8 | 304 |
| 24 | 60 | ft | -13.4 | - 3.1 | | |
| 25 | 80 | ft | -14.0 | - 8.4 | 0.6 | 340 |
| 26 | 100 | ft | -11.7 | -15.2 | 0.6 | 108 |
| 27 | 120 | ft | - 8.5 | -28.4 | | |
| 28 | 140 | ft | - 7.1 | -19.3 | 0.5 | 162 |
| 29 | 160 | ft | - 5.3 | -20.7 | 0.4 | 309 |
| 30 | 180 | ft | - 8.6 | -23.5 | | |
| 31 | 200 | ft | - 8.4 | -27.2 | 0.4 | 2 |
| 32 | 225 | ft | - 8.4 | -31.6 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 1 October 1964.

Weapon No.: M14, serial No. 1563467.

Cartridge: 7.62-mm, M62.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 11.

Velocity at 25 Feet, fps: 2878.

Velocity at 55 Feet, fps: 2853.

Bullet Hole in Peg: Vertical - +3.75.
Horizontal - +0.35.

| Target No. | Distance Peg to Target | | Bullet from | | Bullet Hole | |
|---------------|------------------------------|--|------------------|-------|------------------------------|-----------------------------------|
| | | | Index Point, in. | | Length ^b , in. | Orientation ^b , deg |
| | | | Vert | Hor | | |
| 1 | ^a 3.5 in. | | - 1.8 | - 0.2 | | |
| 2 | 3 in. | | - 1.8 | - 0.2 | | |
| 3 | 1 ft | | - 1.7 | - 0.3 | | |
| 4 | 2 ft | | - 1.7 | - 0.4 | 0.4 | 297 |
| 5 | 3 ft | | - 1.6 | - 0.5 | 0.5 | 317 |
| 6 | 4 ft | | - 1.5 | - 0.6 | 0.6 | 333 |
| 7 | 5 ft | | - 1.4 | - 0.5 | 0.6 | 0 |
| 8 | 6 ft | | - 1.4 | - 0.5 | 0.6 | 19 |
| 9 | 7 ft | | - 1.4 | - 0.6 | 0.6 | 43 |
| 10 | 8 ft | | - 1.4 | - 0.7 | 0.5 | 65 |
| 11 | 9 ft | | - 1.4 | - 0.7 | 0.3 | 88 |
| 12 | 10 ft | | - 1.3 | - 0.9 | | |
| 13 | 11 ft | | - 1.3 | - 1.0 | | |
| 14 | 12 ft | | - 1.1 | - 1.0 | | |
| 15 | 13 ft | | - 0.8 | - 1.0 | 0.5 | 354 |
| 16 | 14 ft | | - 0.6 | - 1.1 | 0.6 | 15 |
| 17 | 15 ft | | - 0.4 | - 1.1 | 0.6 | 37 |
| 18 | 16 ft | | - 0.4 | - 1.0 | 0.6 | 60 |
| 19 | 17 ft | | - 0.4 | - 1.1 | 0.6 | 81 |
| 20 | 18 ft | | - 0.3 | - 1.1 | 0.5 | 100 |
| 21 | 19 ft | | - 0.2 | - 1.1 | 0.4 | 124 |
| 22 | 20 ft | | 0 | - 1.3 | | |
| 23 | 40 ft | | 3.0 | - 0.3 | | |
| 24 | 60 ft | | 4.6 | 2.2 | | |
| 25 | 80 ft | | 4.6 | 5.4 | | |
| 26 | 100 ft | | 5.3 | 3.8 | | |
| 27 | 120 ft | | 7.0 | 4.6 | | |
| 28 | 140 ft | | 8.6 | 6.1 | | |
| 29 | 160 ft | | 9.4 | 7.8 | | |
| 30 | 180 ft | | 10.0 | 8.2 | | |
| 31 | 200 ft | | 11.6 | 9.3 | | |
| 32 | 225 ft | | 12.2 | 10.3 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 1 October 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 12.
 Velocity at 25 Feet, fps: 2894.
 Velocity at 55 Feet, fps: 2874.
 Bullet Hole in Peg: Vertical - +1.80.
 Horizontal - +0.35.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|-------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | - 3.8 | - 0.2 | | |
| 2 | 3 in. | - 3.9 | - 0.3 | | |
| 3 | 1 ft | - 3.6 | - 0.2 | | |
| 4 | 2 ft | - 3.6 | - 0.6 | 0.4 | 297 |
| 5 | 3 ft | - 3.5 | - 0.7 | 0.5 | 316 |
| 6 | 4 ft | - 3.4 | - 0.8 | 0.6 | 335 |
| 7 | 5 ft | - 3.4 | - 0.8 | 0.6 | 356 |
| 8 | 6 ft | - 3.3 | - 0.9 | 0.6 | 17 |
| 9 | 7 ft | - 3.3 | - 1.1 | 0.5 | 37 |
| 10 | 8 ft | - 3.3 | - 1.2 | 0.4 | 54 |
| 11 | 9 ft | - 3.3 | - 1.5 | | |
| 12 | 10 ft | - 3.2 | - 1.7 | | |
| 13 | 11 ft | - 3.1 | - 1.8 | | |
| 14 | 12 ft | - 3.0 | - 1.8 | | |
| 15 | 13 ft | - 2.7 | - 2.0 | 0.5 | 1 |
| 16 | 14 ft | - 2.5 | - 2.1 | 0.5 | 23 |
| 17 | 15 ft | - 2.3 | - 2.2 | 0.6 | 39 |
| 18 | 16 ft | - 2.3 | - 2.2 | 0.6 | 57 |
| 19 | 17 ft | - 2.3 | - 2.4 | 0.5 | 76 |
| 20 | 18 ft | - 2.1 | - 2.4 | 0.5 | 94 |
| 21 | 19 ft | - 2.1 | - 2.6 | 0.4 | 117 |
| 22 | 20 ft | - 1.9 | - 2.9 | | |
| 23 | 40 ft | 1.0 | - 3.5 | | |
| 24 | 60 ft | 2.2 | - 3.1 | | |
| 25 | 80 ft | 2.5 | - 2.4 | | |
| 26 | 100 ft | 4.2 | - 5.9 | | |
| 27 | 120 ft | 6.0 | - 6.2 | | |
| 28 | 140 ft | 7.0 | - 6.7 | | |
| 29 | 160 ft | 8.1 | - 7.8 | | |
| 30 | 180 ft | 9.7 | - 8.9 | | |
| 31 | 200 ft | 11.0 | - 9.1 | | |
| 32 | 225 ft | 11.4 | -11.2 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 1 October 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 13.
 Velocity at 25 Feet, fps: 2853.
 Velocity at 55 Feet, fps: 2829.
 Bullet Hole in Peg: Vertical - +3.40.
 Horizontal - -0.35.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | - 2.1 | 0.4 | | |
| 2 | 3 in. | - 2.1 | 0.4 | | |
| 3 | 1 ft | - 2.0 | 0.5 | | |
| 4 | 2 ft | - 2.0 | 0.6 | | |
| 5 | 3 ft | - 2.1 | 0.5 | 0.4 | 259 |
| 6 | 4 ft | - 2.0 | 0.6 | 0.5 | 288 |
| 7 | 5 ft | - 1.9 | 0.7 | 0.5 | 309 |
| 8 | 6 ft | - 1.9 | 0.8 | 0.5 | 330 |
| 9 | 7 ft | - 1.9 | 0.8 | 0.5 | 350 |
| 10 | 8 ft | - 1.9 | 0.9 | 0.4 | 16 |
| 11 | 9 ft | - 1.9 | 1.1 | 0.3 | 40 |
| 12 | 10 ft | - 1.9 | 1.1 | | |
| 13 | 11 ft | - 2.0 | 1.1 | | |
| 14 | 12 ft | - 1.8 | 1.2 | | |
| 15 | 13 ft | - 1.7 | 1.3 | | |
| 16 | 14 ft | - 1.6 | 1.2 | 0.4 | 319 |
| 17 | 15 ft | - 1.4 | 1.2 | 0.5 | 344 |
| 18 | 16 ft | - 1.4 | 1.3 | 0.5 | 9 |
| 19 | 17 ft | - 1.4 | 1.3 | 0.5 | 29 |
| 20 | 18 ft | - 1.3 | 1.5 | 0.5 | 47 |
| 21 | 19 ft | - 1.3 | 1.5 | 0.4 | 72 |
| 22 | 20 ft | - 1.2 | 1.4 | | |
| 23 | 40 ft | 1.0 | 3.1 | | |
| 24 | 60 ft | 2.6 | 6.1 | | |
| 25 | 80 ft | 3.2 | 10.0 | | |
| 26 | 100 ft | 4.6 | 9.7 | | |
| 27 | 120 ft | 6.2 | 12.2 | | |
| 28 | 140 ft | 7.3 | 14.6 | | |
| 29 | 160 ft | 8.4 | 16.6 | | |
| 30 | 180 ft | 9.9 | 18.4 | | |
| 31 | 200 ft | 11.2 | 21.1 | | |
| 32 | 225 ft | 11.5 | 22.9 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 1 October 1964.
 Weapon No.: M14, serial No. 1563467.
 Cartridge: 7.62-mm, M62.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 14.
 Velocity at 25 Feet, fps: 2849.
 Velocity at 55 Feet, fps: 2825.
 Bullet Hole in Peg: Vertical - +3.80.
 Horizontal - -0.10.

| Target No. | Distance Peg to Target | | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|-----|------------------------------|-----|---------------------------|--------------------------------|
| | | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 | in. | - 1.8 | 0.1 | | |
| 2 | 3 | in. | - 1.8 | 0.1 | | |
| 3 | 1 | ft | - 1.4 | 0.2 | 0.4 | 44 |
| 4 | 2 | ft | - 1.3 | 0.5 | 0.6 | 68 |
| 5 | 3 | ft | - 1.3 | 0.6 | 0.7 | 96 |
| 6 | 4 | ft | - 1.2 | 0.7 | 0.7 | 124 |
| 7 | 5 | ft | - 1.3 | 0.7 | 0.7 | 146 |
| 8 | 6 | ft | - 1.2 | 0.7 | 0.6 | 172 |
| 9 | 7 | ft | - 1.0 | 0.6 | 0.5 | 200 |
| 10 | 8 | ft | - 0.8 | 0.8 | | |
| 11 | 9 | ft | - 0.7 | 0.9 | | |
| 12 | 10 | ft | - 0.6 | 1.1 | | |
| 13 | 11 | ft | - 0.6 | 1.4 | 0.5 | 89 |
| 14 | 12 | ft | - 0.6 | 1.6 | 0.6 | 115 |
| 15 | 13 | ft | - 0.6 | 1.7 | 0.7 | 138 |
| 16 | 14 | ft | - 0.7 | 1.7 | 0.7 | 165 |
| 17 | 15 | ft | - 0.5 | 1.7 | 0.7 | 192 |
| 18 | 16 | ft | - 0.5 | 1.8 | 0.6 | 215 |
| 19 | 17 | ft | - 0.5 | 1.8 | 0.4 | 240 |
| 20 | 18 | ft | - 0.3 | 2.3 | | |
| 21 | 19 | ft | - 0.4 | 2.3 | | |
| 22 | 20 | ft | - 0.4 | 2.4 | | |
| 23 | 40 | ft | - 2.5 | 4.8 | 0.5 | 198 |
| 24 | 60 | ft | - 5.5 | 5.2 | 0.6 | 293 |
| 25 | 80 | ft | - 7.8 | 5.4 | 0.5 | 35 |
| 26 | 100 | ft | - 8.2 | 2.2 | | 146 |
| 27 | 120 | ft | - 8.2 | 2.4 | | |
| 28 | 140 | ft | - 9.3 | 3.0 | | |
| 29 | 160 | ft | -10.9 | 2.9 | | |
| 30 | 180 | ft | -12.0 | 2.0 | | |
| 31 | 200 | ft | -12.5 | 2.1 | | |
| 32 | 225 | ft | -15.1 | 1.7 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 1 October 1964.

Weapon No.: M14, serial No. 1563467.

Cartridge: 7.62-mm, M62.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 15.

Velocity at 25 Feet, fps: 2878.

Velocity at 55 Feet, fps: 2853.

Bullet Hole in Peg: Vertical - +2.30.
Horizontal - -0.10.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | - 3.3 | 0.2 | | |
| 2 | 3 in. | - 3.3 | 0.1 | | |
| 3 | 1 ft | - 3.1 | 0.5 | 0.5 | 89 |
| 4 | 2 ft | - 3.1 | 0.7 | 0.7 | 115 |
| 5 | 3 ft | - 3.3 | 0.8 | 0.8 | 142 |
| 6 | 4 ft | - 3.4 | 0.8 | 0.9 | 167 |
| 7 | 5 ft | - 3.4 | 0.8 | 0.9 | 193 |
| 8 | 6 ft | - 3.3 | 0.9 | 0.7 | 217 |
| 9 | 7 ft | - 3.2 | 0.9 | 0.5 | 243 |
| 10 | 8 ft | - 3.2 | 1.3 | | |
| 11 | 9 ft | - 3.3 | 1.4 | | |
| 12 | 10 ft | - 3.4 | 1.8 | 0.6 | 120 |
| 13 | 11 ft | - 3.7 | 1.9 | 0.8 | 145 |
| 14 | 12 ft | - 3.9 | 2.0 | 0.9 | 169 |
| 15 | 13 ft | - 4.0 | 2.0 | 0.9 | 195 |
| 16 | 14 ft | - 4.0 | 2.0 | 0.8 | 221 |
| 17 | 15 ft | - 3.9 | 2.1 | 0.6 | 247 |
| 18 | 16 ft | - 4.0 | 2.3 | 0.4 | 271 |
| 19 | 17 ft | - 4.3 | 2.5 | | |
| 20 | 18 ft | - 4.4 | 2.8 | 0.4 | 128 |
| 21 | 19 ft | - 4.8 | 3.0 | 0.6 | 151 |
| 22 | 20 ft | - 5.2 | 2.9 | 0.8 | 175 |
| 23 | 40 ft | -11.3 | 3.1 | 0.7 | 289 |
| 24 | 60 ft | -17.3 | -0.1 | | |
| 25 | 80 ft | Missed | | | |
| 26 | 100 ft | Missed | | | |
| 27 | 120 ft | Missed | | | |
| 28 | 140 ft | Missed | | | |
| 29 | 160 ft | Missed | | | |
| 30 | 180 ft | Missed | | | |
| 31 | 200 ft | Missed | | | |
| 32 | 225 ft | Missed | | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.

Weapon No.: M16, serial No. 008651.

Cartridge: 5.56-mm, XM196.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 1.

Velocity at 25 Feet, fps: 3021.

Velocity at 55 Feet, fps: 2981.

Bullet Hole in Peg: Vertical -
Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -3.0 | -0.5 | | |
| 2 | 3 in. | -3.0 | -0.4 | | |
| 3 | 1 ft | -2.9 | -0.4 | | |
| 4 | 2 ft | -2.9 | -0.4 | | |
| 5 | 3 ft | -2.9 | -0.4 | | |
| 6 | 4 ft | -2.9 | -0.4 | | |
| 7 | 5 ft | -2.9 | -0.4 | | |
| 8 | 6 ft | -2.9 | -0.4 | | |
| 9 | 7 ft | -2.9 | -0.4 | | |
| 10 | 8 ft | -2.9 | -0.5 | | |
| 11 | 9 ft | -2.9 | -0.5 | | |
| 12 | 10 ft | -2.9 | -0.5 | | |
| 13 | 11 ft | -2.9 | -0.4 | | |
| 14 | 12 ft | -2.9 | -0.4 | | |
| 15 | 13 ft | -2.9 | -0.4 | | |
| 16 | 14 ft | -2.9 | -0.4 | | |
| 17 | 15 ft | -2.9 | -0.4 | | |
| 18 | 16 ft | -2.9 | -0.4 | | |
| 19 | 17 ft | -2.9 | -0.4 | | |
| 20 | 18 ft | -2.9 | -0.4 | | |
| 21 | 19 ft | -2.9 | -0.4 | | |
| 22 | 20 ft | -3.0 | -0.5 | | |
| 23 | 40 ft | -3.1 | -0.8 | | |
| 24 | 60 ft | -3.1 | -0.8 | | |
| 25 | 80 ft | -3.2 | -0.9 | | |
| 26 | 100 ft | -3.2 | -0.9 | | |
| 27 | 120 ft | -3.3 | -1.1 | | |
| 28 | 140 ft | -3.5 | -1.2 | | |
| 29 | 160 ft | -3.6 | -1.4 | | |
| 30 | 180 ft | -3.8 | -1.4 | | |
| 31 | 200 ft | -4.0 | -1.6 | | |
| 32 | 225 ft | -5.1 | -2.2 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 2.
 Velocity at 25 Feet, fps: 3003.
 Velocity at 55 Feet, fps: 2972.
 Bullet Hole in Peg: Vertical -
 Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -3.0 | -1.0 | | |
| 2 | 3 in. | -3.0 | -0.8 | | |
| 3 | 1 ft | -2.8 | -0.9 | | |
| 4 | 2 ft | -2.9 | -0.8 | | |
| 5 | 3 ft | -2.9 | -0.8 | | |
| 6 | 4 ft | -2.8 | -0.8 | | |
| 7 | 5 ft | -2.9 | -0.8 | | |
| 8 | 6 ft | -2.9 | -0.8 | | |
| 9 | 7 ft | -2.9 | -0.9 | | |
| 10 | 8 ft | -2.9 | -0.9 | | |
| 11 | 9 ft | -2.9 | -0.9 | | |
| 12 | 10 ft | -2.9 | -0.9 | | |
| 13 | 11 ft | -2.9 | -0.9 | | |
| 14 | 12 ft | -2.9 | -0.9 | | |
| 15 | 13 ft | -2.9 | -0.9 | | |
| 16 | 14 ft | -2.9 | -0.9 | | |
| 17 | 15 ft | -2.8 | -1.0 | | |
| 18 | 16 ft | -2.8 | -1.0 | | |
| 19 | 17 ft | -2.9 | -1.0 | | |
| 20 | 18 ft | -2.8 | -1.0 | | |
| 21 | 19 ft | -2.8 | -1.1 | | |
| 22 | 20 ft | -2.8 | -1.1 | | |
| 23 | 40 ft | -3.0 | -1.2 | | |
| 24 | 60 ft | -2.8 | -1.5 | | |
| 25 | 80 ft | -3.1 | -1.6 | | |
| 26 | 100 ft | -2.9 | -1.8 | | |
| 27 | 120 ft | -3.2 | -2.1 | | |
| 28 | 140 ft | -3.3 | -2.4 | | |
| 29 | 160 ft | -3.3 | -2.6 | | |
| 30 | 180 ft | -3.5 | -2.8 | | |
| 31 | 200 ft | -3.7 | -3.1 | | |
| 32 | 225 ft | -4.8 | -3.9 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1965.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 3.
 Velocity at 25 Feet, fps: 2933.
 Velocity at 55 Feet, fps: 2894.
 Bullet Hole in Peg: Vertical -
 Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.5 | -0.9 | | |
| 2 | 3 in. | -2.4 | -0.8 | | |
| 3 | 1 ft | -2.3 | -0.8 | | |
| 4 | 2 ft | -2.2 | -0.8 | | |
| 5 | 3 ft | -2.3 | -0.8 | | |
| 6 | 4 ft | -2.3 | -0.9 | | |
| 7 | 5 ft | -2.3 | -0.8 | | |
| 8 | 6 ft | -2.4 | -0.8 | | |
| 9 | 7 ft | -2.3 | -0.9 | | |
| 10 | 8 ft | -2.3 | -0.9 | | |
| 11 | 9 ft | -2.3 | -0.9 | | |
| 12 | 10 ft | -2.3 | -0.9 | | |
| 13 | 11 ft | -2.3 | -0.9 | | |
| 14 | 12 ft | -2.3 | -0.8 | | |
| 15 | 13 ft | -2.2 | -0.9 | | |
| 16 | 14 ft | -2.1 | -0.9 | | |
| 17 | 15 ft | -2.2 | -0.9 | | |
| 18 | 16 ft | -2.2 | -0.9 | | |
| 19 | 17 ft | -2.2 | -0.9 | | |
| 20 | 18 ft | -2.2 | -0.9 | | |
| 21 | 19 ft | -2.2 | -0.9 | | |
| 22 | 20 ft | -2.2 | -1.0 | | |
| 23 | 40 ft | -2.2 | -1.2 | | |
| 24 | 60 ft | -2.0 | -1.3 | | |
| 25 | 80 ft | -1.9 | -1.3 | | |
| 26 | 100 ft | -1.8 | -1.5 | | |
| 27 | 120 ft | -1.7 | -1.6 | | |
| 28 | 140 ft | -1.8 | -1.9 | | |
| 29 | 160 ft | -1.7 | -1.9 | | |
| 30 | 180 ft | -1.7 | -2.2 | | |
| 31 | 200 ft | -1.8 | -2.2 | | |
| 32 | 225 ft | -2.7 | -2.9 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.

Weapon No.: M16, serial No. 008651.

Cartridge: 5.56-mm, XM196.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 4.

Velocity at 25 Feet, fps: 2981.

Velocity at 55 Feet, fps: 2941.

Bullet Hole in Peg: Vertical -
Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.7 | -0.4 | | |
| 2 | 3 in. | -2.7 | -0.3 | | |
| 3 | 1 ft | -2.5 | -0.3 | | |
| 4 | 2 ft | -2.5 | -0.3 | | |
| 5 | 3 ft | -2.5 | -0.3 | | |
| 6 | 4 ft | -2.5 | -0.3 | | |
| 7 | 5 ft | -2.5 | -0.2 | | |
| 8 | 6 ft | -2.6 | -0.2 | | |
| 9 | 7 ft | -2.6 | -0.3 | | |
| 10 | 8 ft | -2.6 | -0.3 | | |
| 11 | 9 ft | -2.6 | -0.2 | | |
| 12 | 10 ft | -2.6 | -0.3 | | |
| 13 | 11 ft | -2.6 | -0.3 | | |
| 14 | 12 ft | -2.6 | -0.2 | | |
| 15 | 13 ft | -2.6 | -0.2 | | |
| 16 | 14 ft | -2.6 | -0.3 | | |
| 17 | 15 ft | -2.5 | -0.3 | | |
| 18 | 16 ft | -2.6 | -0.3 | | |
| 19 | 17 ft | -2.6 | -0.4 | | |
| 20 | 18 ft | -2.5 | -0.3 | | |
| 21 | 19 ft | -2.5 | -0.3 | | |
| 22 | 20 ft | -2.5 | -0.3 | | |
| 23 | 40 ft | -2.7 | -0.5 | | |
| 24 | 60 ft | -2.5 | -0.7 | | |
| 25 | 80 ft | -2.8 | -0.7 | | |
| 26 | 100 ft | -2.6 | -0.9 | | |
| 27 | 120 ft | -2.8 | -1.0 | | |
| 28 | 140 ft | -3.0 | -1.3 | | |
| 29 | 160 ft | -3.1 | -1.4 | | |
| 30 | 180 ft | -3.3 | -1.5 | | |
| 31 | 200 ft | -3.5 | -1.7 | | |
| 32 | 225 ft | -4.6 | -2.5 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.

Weapon No.: M16, serial No. 008651.

Cartridge: 5.56-mm, XM196.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 5.

Velocity at 25 Feet, fps: 2985.

Velocity at 55 Feet, fps: 2950.

Bullet Hole in Peg: Vertical -
Horizontal -

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.6 | -0.8 | | |
| 2 | 3 in. | -2.6 | -0.7 | | |
| 3 | 1 ft | -2.4 | -0.7 | | |
| 4 | 2 ft | -2.4 | -0.7 | | |
| 5 | 3 ft | -2.4 | -0.7 | | |
| 6 | 4 ft | -2.4 | -0.7 | | |
| 7 | 5 ft | -2.4 | -0.7 | | |
| 8 | 6 ft | -2.5 | -0.7 | | |
| 9 | 7 ft | -2.5 | -0.7 | | |
| 10 | 8 ft | -2.5 | -0.7 | | |
| 11 | 9 ft | -2.5 | -0.7 | | |
| 12 | 10 ft | -2.4 | -0.7 | | |
| 13 | 11 ft | -2.5 | -0.7 | | |
| 14 | 12 ft | -2.5 | -0.6 | | |
| 15 | 13 ft | -2.4 | -0.7 | | |
| 16 | 14 ft | -2.4 | -0.7 | | |
| 17 | 15 ft | -2.3 | -0.8 | | |
| 18 | 16 ft | -2.3 | -0.8 | | |
| 19 | 17 ft | -2.4 | -0.8 | | |
| 20 | 18 ft | -2.3 | -0.7 | | |
| 21 | 19 ft | -2.3 | -0.8 | | |
| 22 | 20 ft | -2.3 | -0.8 | | |
| 23 | 40 ft | -2.3 | -1.0 | | |
| 24 | 60 ft | -2.1 | -1.2 | | |
| 25 | 80 ft | -2.2 | -1.2 | | |
| 26 | 100 ft | -1.9 | -1.4 | | |
| 27 | 120 ft | -2.0 | -1.5 | | |
| 28 | 140 ft | -2.0 | -1.8 | | |
| 29 | 160 ft | -2.0 | -1.8 | | |
| 30 | 180 ft | -2.0 | -2.0 | | |
| 31 | 200 ft | -2.1 | -2.2 | | |
| 32 | 225 ft | -3.1 | -2.9 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 6.
 Velocity at 25 Feet, fps: 2981.
 Velocity at 55 Feet, fps: 2946.
 Bullet Hole in Peg: Vertical - +2.65.
 Horizontal - +0.15.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|-------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^a , in. | Orientation ^b , deg |
| 1 | a 3.5 in. | -3.0 | - 0.1 | | |
| 2 | 3 in. | -2.9 | 0 | | |
| 3 | 1 ft | -2.8 | - 0.1 | 0.2 | 304 |
| 4 | 2 ft | -2.6 | - 0.2 | 0.3 | 332 |
| 5 | 3 ft | -2.5 | - 0.3 | 0.4 | 2 |
| 6 | 4 ft | -2.4 | - 0.3 | 0.5 | 28 |
| 7 | 5 ft | -2.4 | - 0.2 | 0.5 | 57 |
| 8 | 6 ft | -2.4 | - 0.3 | 0.4 | 79 |
| 9 | 7 ft | -2.4 | - 0.5 | 0.3 | 117 |
| 10 | 8 ft | -2.3 | - 0.6 | 0.2 | 140 |
| 11 | 9 ft | -2.2 | - 0.6 | 0.2 | 175 |
| 12 | 10 ft | -2.1 | - 0.7 | 0.3 | 201 |
| 13 | 11 ft | -1.9 | - 0.8 | 0.4 | 222 |
| 14 | 12 ft | -1.7 | - 0.8 | 0.4 | 245 |
| 15 | 13 ft | -1.4 | - 0.8 | 0.4 | 271 |
| 16 | 14 ft | -1.1 | - 0.8 | 0.4 | 300 |
| 17 | 15 ft | -0.9 | - 0.6 | 0.3 | 321 |
| 18 | 16 ft | -0.8 | - 0.4 | 0.2 | 356 |
| 19 | 17 ft | -0.8 | - 0.4 | 0.2 | - |
| 20 | 18 ft | -0.5 | - 0.2 | 0.2 | 50 |
| 21 | 19 ft | -0.5 | - 0.1 | 0.3 | 71 |
| 22 | 20 ft | -0.4 | - 0.1 | 0.4 | 103 |
| 23 | 40 ft | 0.6 | 3.1 | 0.2 | 277 |
| 24 | 60 ft | -0.2 | 4.5 | 0.3 | 309 |
| 25 | 80 ft | 0.5 | 5.3 | 0.2 | 141 |
| 26 | 100 ft | 1.5 | 7.4 | | |
| 27 | 120 ft | 1.3 | 8.6 | 0.3 | 22 |
| 28 | 140 ft | 2.1 | 9.8 | | |
| 29 | 160 ft | 2.3 | 11.6 | | |
| 30 | 180 ft | 2.9 | 12.8 | 0.2 | 138 |
| 31 | 200 ft | 3.1 | 14.5 | | |
| 32 | 225 ft | 2.9 | 15.8 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 7.
 Velocity at 25 Feet, fps: 2967.
 Velocity at 55 Feet, fps: 2933.
 Bullet Hole in Peg: Vertical = +3.25.
 Horizontal = +0.40.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|-------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.3 | - 0.4 | | |
| 2 | 3 in. | -2.3 | - 0.3 | | |
| 3 | 1 ft | -2.2 | - 0.3 | | |
| 4 | 2 ft | -2.1 | - 0.3 | | |
| 5 | 3 ft | -2.3 | - 0.3 | 0.3 | 167 |
| 6 | 4 ft | -2.3 | - 0.3 | 0.3 | 154 |
| 7 | 5 ft | -2.3 | - 0.3 | 0.3 | 223 |
| 8 | 6 ft | -2.4 | - 0.4 | 0.3 | 251 |
| 9 | 7 ft | -2.3 | - 0.5 | 0.3 | 278 |
| 10 | 8 ft | -2.3 | - 0.5 | 0.3 | 301 |
| 11 | 9 ft | -2.3 | - 0.5 | 0.2 | 324 |
| 12 | 10 ft | -2.3 | - 0.5 | 0.2 | 359 |
| 13 | 11 ft | -2.4 | - 0.6 | | |
| 14 | 12 ft | -2.4 | - 0.6 | | |
| 15 | 13 ft | -2.4 | - 0.7 | | |
| 16 | 14 ft | -2.4 | - 0.9 | 0.2 | 269 |
| 17 | 15 ft | -2.3 | - 0.9 | 0.2 | 301 |
| 18 | 16 ft | -2.3 | - 1.0 | 0.3 | 324 |
| 19 | 17 ft | -2.4 | - 1.1 | 0.3 | 354 |
| 20 | 18 ft | -2.3 | - 1.1 | 0.3 | 20 |
| 21 | 19 ft | -2.3 | - 1.2 | 0.3 | 46 |
| 22 | 20 ft | -2.3 | - 1.2 | 0.2 | 68 |
| 23 | 40 ft | -1.8 | - 2.3 | 0.2 | 214 |
| 24 | 60 ft | -1.2 | - 3.3 | 0.2 | 35 |
| 25 | 80 ft | -1.3 | - 4.1 | | |
| 26 | 100 ft | -1.1 | - 5.2 | | |
| 27 | 120 ft | -0.9 | - 6.1 | 0.2 | 186 |
| 28 | 140 ft | -0.8 | - 7.3 | | |
| 29 | 160 ft | -0.5 | - 8.1 | | |
| 30 | 180 ft | -0.4 | - 9.3 | | |
| 31 | 200 ft | -0.2 | -10.2 | | |
| 32 | 225 ft | -0.9 | -12.1 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.

Weapon No.: M16, serial No. 008651.

Cartridge: 5.56-mm, XM196.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 8.

Velocity at 25 Feet, fps: 2959.

Velocity at 55 Feet, fps: 2920.

Bullet Hole in Peg: Vertical - +3.20.
Horizontal - +0.10.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|-------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^a , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.5 | 0 | | |
| 2 | 3 in. | -2.4 | 0 | | |
| 3 | 1 ft | -2.2 | - 0.1 | 0.3 | 310 |
| 4 | 2 ft | -2.1 | - 0.1 | 0.4 | 335 |
| 5 | 3 ft | -2.1 | - 0.2 | 0.5 | 9 |
| 6 | 4 ft | -2.0 | - 0.2 | 0.5 | 37 |
| 7 | 5 ft | -2.0 | - 0.1 | 0.4 | 63 |
| 8 | 6 ft | -2.1 | - 0.2 | 0.3 | 92 |
| 9 | 7 ft | -2.0 | - 0.5 | 0.2 | 128 |
| 10 | 8 ft | -1.9 | - 0.5 | | |
| 11 | 9 ft | -1.7 | - 0.5 | 0.3 | 350 |
| 12 | 10 ft | -1.5 | - 0.5 | 0.4 | 17 |
| 13 | 11 ft | -1.4 | - 0.5 | 0.4 | 45 |
| 14 | 12 ft | -1.3 | - 0.3 | 0.5 | 71 |
| 15 | 13 ft | -1.2 | - 0.3 | 0.4 | 100 |
| 16 | 14 ft | -1.1 | - 0.4 | 0.4 | 128 |
| 17 | 15 ft | -0.9 | - 0.4 | 0.3 | 156 |
| 18 | 16 ft | -0.7 | - 0.4 | | |
| 19 | 17 ft | -0.7 | - 0.3 | | |
| 20 | 18 ft | -0.3 | - 0.1 | 0.3 | 50 |
| 21 | 19 ft | -0.4 | + 0.1 | 0.4 | 78 |
| 22 | 20 ft | -0.2 | + 0.2 | 0.4 | 111 |
| 23 | 40 ft | 0.9 | 3.8 | | |
| 24 | 60 ft | -0.8 | 6.6 | 0.4 | 308 |
| 25 | 80 ft | -1.7 | 7.4 | | |
| 26 | 100 ft | -0.8 | 9.3 | 0.3 | 172 |
| 27 | 120 ft | -1.7 | 11.9 | | |
| 28 | 140 ft | -2.4 | 13.0 | 0.3 | 233 |
| 29 | 160 ft | -2.5 | 15.4 | | |
| 30 | 180 ft | -3.5 | 17.0 | | |
| 31 | 200 ft | -3.7 | 19.2 | | |
| 32 | 225 ft | -5.8 | 21.0 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 28 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 9.
 Velocity at 25 Feet, fps: 2972.
 Velocity at 55 Feet, fps: 2937.
 Bullet Hole in Peg: Vertical - +2.85.
 Horizontal - -0.10.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|-------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^a , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.8 | 0.1 | | |
| 2 | 3 in. | -2.8 | 0.2 | | |
| 3 | 1 ft | -2.5 | 0.3 | 0.3 | 123 |
| 4 | 2 ft | -2.5 | 0.5 | 0.4 | 140 |
| 5 | 3 ft | -2.6 | 0.5 | 0.5 | 171 |
| 6 | 4 ft | -2.6 | 0.6 | 0.5 | 200 |
| 7 | 5 ft | -2.5 | 0.7 | 0.5 | 226 |
| 8 | 6 ft | -2.5 | 0.7 | 0.4 | 255 |
| 9 | 7 ft | -2.4 | 0.8 | 0.3 | 287 |
| 10 | 8 ft | -2.5 | 1.0 | | |
| 11 | 9 ft | -2.6 | 1.1 | 0.2 | 142 |
| 12 | 10 ft | -2.7 | 1.1 | 0.3 | 174 |
| 13 | 11 ft | -2.8 | 1.1 | 0.4 | 208 |
| 14 | 12 ft | -2.8 | 1.2 | 0.5 | 231 |
| 15 | 13 ft | -2.8 | 1.1 | 0.5 | 261 |
| 16 | 14 ft | -2.8 | 1.2 | 0.4 | 287 |
| 17 | 15 ft | -2.8 | 1.2 | 0.3 | 314 |
| 18 | 16 ft | -3.0 | 1.2 | | |
| 19 | 17 ft | -3.1 | 1.2 | | |
| 20 | 18 ft | -3.2 | 1.1 | 0.3 | 217 |
| 21 | 19 ft | -3.3 | 0.9 | 0.4 | 244 |
| 22 | 20 ft | -3.4 | 0.8 | 0.5 | 271 |
| 23 | 40 ft | -3.8 | - 2.7 | | |
| 24 | 60 ft | -1.0 | - 5.2 | 0.4 | 110 |
| 25 | 80 ft | 0.3 | - 5.4 | 0.2 | 313 |
| 26 | 100 ft | 0.6 | - 7.4 | 0.2 | 321 |
| 27 | 120 ft | 2.2 | - 9.1 | 0.3 | 173 |
| 28 | 140 ft | 2.9 | -10.3 | | |
| 29 | 160 ft | 4.0 | -12.3 | 0.3 | 253 |
| 30 | 180 ft | 5.0 | -13.2 | 0.2 | 259 |
| 31 | 200 ft | 5.9 | -15.1 | | |
| 32 | 225 ft | 6.2 | -17.1 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 29 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 10.
 Velocity at 25 Feet, fps: 3008.
 Velocity at 55 Feet, fps: 2967.
 Bullet Hole in Peg: Vertical - +3.00.
 Horizontal - -0.10.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|-------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.6 | 0.1 | | |
| 2 | 3 in. | -2.5 | 0.2 | | |
| 3 | 1 ft | -2.4 | 0.3 | 0.3 | 112 |
| 4 | 2 ft | -2.4 | 0.5 | 0.4 | 136 |
| 5 | 3 ft | -2.5 | 0.6 | 0.5 | 163 |
| 6 | 4 ft | -2.5 | 0.5 | 0.5 | 195 |
| 7 | 5 ft | -2.5 | 0.6 | 0.5 | 222 |
| 8 | 6 ft | -2.4 | 0.7 | 0.4 | 250 |
| 9 | 7 ft | -2.4 | 0.8 | 0.2 | 285 |
| 10 | 8 ft | -2.5 | 1.0 | 0.2 | 128 |
| 11 | 9 ft | -2.7 | 1.1 | 0.3 | 151 |
| 12 | 10 ft | -2.8 | 1.1 | 0.5 | 181 |
| 13 | 11 ft | -2.9 | 1.1 | 0.5 | 209 |
| 14 | 12 ft | -2.9 | 1.2 | 0.5 | 236 |
| 15 | 13 ft | -3.0 | 1.2 | 0.4 | 269 |
| 16 | 14 ft | -3.0 | 1.2 | 0.3 | 301 |
| 17 | 15 ft | -3.2 | 1.3 | | |
| 18 | 16 ft | -3.4 | 1.4 | 0.2 | 160 |
| 19 | 17 ft | -3.7 | 1.2 | 0.4 | 197 |
| 20 | 18 ft | -3.8 | 1.2 | 0.5 | 221 |
| 21 | 19 ft | -4.0 | 1.0 | 0.5 | 254 |
| 22 | 20 ft | -4.1 | 0.9 | 0.5 | 284 |
| 23 | 40 ft | -7.6 | - 3.0 | 0.4 | 305 |
| 24 | 60 ft | -7.4 | - 8.8 | | |
| 25 | 80 ft | -5.5 | -11.5 | 0.3 | 210 |
| 26 | 100 ft | -5.9 | -12.9 | 0.4 | 252 |
| 27 | 120 ft | -7.2 | -16.4 | 0.3 | 303 |
| 28 | 140 ft | -6.8 | -19.8 | 0.2 | 207 |
| 29 | 160 ft | -7.2 | -22.1 | 0.3 | 259 |
| 30 | 180 ft | -7.6 | -25.4 | | |
| 31 | 200 ft | -7.5 | -28.1 | | |
| 32 | 225 ft | -9.0 | -32.4 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 29 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 11.
 Velocity at 25 Feet, fps: 3008.
 Velocity at 55 Feet, fps: 2967.
 Bullet Hole in Peg: Vertical - +3.00.
 Horizontal - -0.15.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|-------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | - 2.5 | 0.1 | | |
| 2 | 3 in. | - 2.5 | 0.3 | 0.2 | 90 |
| 3 | 1 ft | - 2.3 | 0.5 | 0.3 | 115 |
| 4 | 2 ft | - 2.4 | 0.6 | 0.5 | 145 |
| 5 | 3 ft | - 2.5 | 0.8 | 0.6 | 174 |
| 6 | 4 ft | - 2.4 | 0.8 | 0.6 | 205 |
| 7 | 5 ft | - 2.3 | 0.9 | 0.5 | 233 |
| 8 | 6 ft | - 2.3 | 1.1 | 0.3 | 265 |
| 9 | 7 ft | - 2.2 | 1.3 | 0.2 | 294 |
| 10 | 8 ft | - 2.4 | 1.6 | 0.3 | 134 |
| 11 | 9 ft | - 2.6 | 1.7 | 0.5 | 162 |
| 12 | 10 ft | - 2.7 | 1.8 | 0.6 | 191 |
| 13 | 11 ft | - 2.8 | 1.8 | 0.6 | 221 |
| 14 | 12 ft | - 2.7 | 1.9 | 0.5 | 250 |
| 15 | 13 ft | - 2.8 | 2.1 | 0.4 | 282 |
| 16 | 14 ft | - 3.0 | 2.2 | | |
| 17 | 15 ft | - 3.2 | 2.4 | 0.3 | 146 |
| 18 | 16 ft | - 3.5 | 2.4 | 0.4 | 173 |
| 19 | 17 ft | - 3.7 | 2.3 | 0.5 | 210 |
| 20 | 18 ft | - 3.8 | 2.3 | 0.6 | 237 |
| 21 | 19 ft | - 4.0 | 2.2 | 0.5 | 269 |
| 22 | 20 ft | - 4.2 | 2.3 | 0.4 | 299 |
| 23 | 40 ft | - 9.3 | - 0.9 | 0.5 | 331 |
| 24 | 60 ft | -11.4 | - 8.2 | 0.5 | 10 |
| 25 | 80 ft | - 9.8 | -13.7 | 0.3 | 59 |
| 26 | 100 ft | - 8.8 | -16.2 | | |
| 27 | 120 ft | -11.0 | -19.2 | | |
| 28 | 140 ft | -11.8 | -24.4 | 0.3 | 64 |
| 29 | 160 ft | -11.8 | -28.0 | | |
| 30 | 180 ft | Missed | | | |
| 31 | 200 ft | Missed | | | |
| 32 | 225 ft | -15.9 | -41.7 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 29 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 12.
 Velocity at 25 Feet, fps: 3012.
 Velocity at 55 Feet, fps: 2972.
 Bullet Hole in Peg: Vertical - +2.80
 Horizontal - -0.25.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.8 | 0.4 | | |
| 2 | 3 in. | -2.7 | 0.5 | | |
| 3 | 1 ft | -2.6 | 0.7 | 0.2 | 120 |
| 4 | 2 ft | -2.6 | 0.9 | 0.2 | 149 |
| 5 | 3 ft | -2.7 | 1.0 | 0.3 | 174 |
| 6 | 4 ft | -2.7 | 1.2 | 0.3 | 205 |
| 7 | 5 ft | -2.7 | 1.4 | 0.3 | 226 |
| 8 | 6 ft | -2.8 | 1.6 | 0.3 | 248 |
| 9 | 7 ft | -2.8 | 1.7 | 0.3 | 280 |
| 10 | 8 ft | -2.8 | 2.0 | 0.2 | 315 |
| 11 | 9 ft | -2.9 | 2.2 | | |
| 12 | 10 ft | -2.9 | 2.4 | | |
| 13 | 11 ft | -3.0 | 2.6 | 0.2 | 180 |
| 14 | 12 ft | -3.0 | 2.7 | 0.2 | 220 |
| 15 | 13 ft | -3.0 | 2.9 | 0.2 | 259 |
| 16 | 14 ft | -3.0 | 3.0 | 0.3 | 284 |
| 17 | 15 ft | -3.0 | 3.2 | 0.3 | 309 |
| 18 | 16 ft | -3.0 | 3.3 | 0.3 | 335 |
| 19 | 17 ft | -3.0 | 3.5 | 0.3 | 4 |
| 20 | 18 ft | -3.0 | 3.7 | 0.3 | 35 |
| 21 | 19 ft | -3.1 | 3.7 | | |
| 22 | 20 ft | -3.1 | 3.9 | | |
| 23 | 40 ft | -2.7 | 7.0 | | |
| 24 | 60 ft | -2.7 | 10.4 | | |
| 25 | 80 ft | -2.6 | 13.6 | | |
| 26 | 100 ft | -2.6 | 17.2 | | |
| 27 | 120 ft | -2.5 | 20.2 | | |
| 28 | 140 ft | -2.8 | 23.7 | | |
| 29 | 160 ft | -2.6 | 26.8 | | |
| 30 | 180 ft | -2.6 | 30.2 | | |
| 31 | 200 ft | -2.7 | 33.4 | | |
| 32 | 225 ft | -3.7 | 37.1 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 29 September 1964.

Weapon No.: M16, serial No. 008651.

Cartridge: 5.56-mm, XM196.

Distance from Rifle to Peg: 25 yards.

Diameter of Peg: 1/2 inch.

Type of Wood: Birch.

Round No.: 13.

Velocity at 25 Feet, fps: 2981.

Velocity at 55 Feet, fps: 2941.

Bullet Hole in Peg: Vertical - +3.15.
Horizontal - 0.0.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|---------------|------------------------------|---------------------------------|------|------------------------------|-----------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.4 | 0 | | |
| 2 | 3 in. | -2.4 | 0.1 | | |
| 3 | 1 ft | -2.3 | 0.1 | | |
| 4 | 2 ft | -2.2 | 0.1 | | |
| 5 | 3 ft | -2.1 | 0.1 | | |
| 6 | 4 ft | -2.0 | 0.1 | | |
| 7 | 5 ft | -2.0 | 0.1 | | |
| 8 | 6 ft | -2.0 | 0.1 | | |
| 9 | 7 ft | -1.9 | 0 | | |
| 10 | 8 ft | -1.8 | 0 | | |
| 11 | 9 ft | -1.7 | 0 | | |
| 12 | 10 ft | -1.6 | 0.1 | | |
| 13 | 11 ft | -1.6 | 0.1 | | |
| 14 | 12 ft | -1.5 | 0.2 | | |
| 15 | 13 ft | -1.4 | 0.2 | | |
| 16 | 14 ft | -1.4 | 0.2 | | |
| 17 | 15 ft | -1.2 | 0.2 | | |
| 18 | 16 ft | -1.2 | 0.2 | | |
| 19 | 17 ft | -1.2 | 0.2 | | |
| 20 | 18 ft | -1.1 | 0.2 | | |
| 21 | 19 ft | -1.1 | 0.2 | | |
| 22 | 20 ft | -1.0 | 0.2 | | |
| 23 | 40 ft | 0.1 | -0.3 | | |
| 24 | 60 ft | 1.4 | -0.1 | | |
| 25 | 80 ft | 2.5 | -0.3 | | |
| 26 | 100 ft | 3.8 | -0.2 | | |
| 27 | 120 ft | 4.9 | -0.4 | | |
| 28 | 140 ft | 6.0 | -0.4 | | |
| 29 | 160 ft | 7.2 | -0.6 | | |
| 30 | 180 ft | 8.2 | -0.5 | | |
| 31 | 200 ft | 9.3 | -0.7 | | |
| 32 | 225 ft | 9.6 | -1.2 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 29 September 1964.
 Weapon No.: M16, serial No. 008651.
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 14.
 Velocity at 25 Feet, fps: 2959.
 Velocity at 55 Feet, fps: 2920.
 Bullet Hole in Peg: Vertical - +3.20.
 Horizontal - +0.30.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|--------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.4 | - 0.3 | | |
| 2 | 3 in. | -2.3 | - 0.2 | | |
| 3 | 1 ft | -2.2 | - 0.3 | 0.2 | 115 |
| 4 | 2 ft | -2.3 | - 0.3 | 0.3 | 138 |
| 5 | 3 ft | -2.4 | - 0.3 | 0.3 | 167 |
| 6 | 4 ft | -2.4 | - 0.4 | 0.4 | 193 |
| 7 | 5 ft | -2.4 | - 0.4 | 0.4 | 222 |
| 8 | 6 ft | -2.5 | - 0.5 | 0.4 | 245 |
| 9 | 7 ft | -2.5 | - 0.7 | 0.3 | 266 |
| 10 | 8 ft | -2.5 | - 0.7 | 0.2 | 303 |
| 11 | 9 ft | -2.6 | - 0.7 | | |
| 12 | 10 ft | -2.7 | - 0.8 | | |
| 13 | 11 ft | -2.8 | - 0.9 | 0.2 | 202 |
| 14 | 12 ft | -2.9 | - 1.0 | 0.3 | 230 |
| 15 | 13 ft | -2.9 | - 1.1 | 0.4 | 249 |
| 16 | 14 ft | -3.0 | - 1.3 | 0.4 | 274 |
| 17 | 15 ft | -2.9 | - 1.4 | 0.4 | 302 |
| 18 | 16 ft | -3.0 | - 1.5 | 0.3 | 327 |
| 19 | 17 ft | -3.2 | - 1.7 | 0.3 | 357 |
| 20 | 18 ft | -3.2 | - 1.8 | | |
| 21 | 19 ft | -3.3 | - 2.0 | | |
| 22 | 20 ft | -3.4 | - 2.2 | | |
| 23 | 40 ft | -3.3 | - 5.7 | 0.3 | 72 |
| 24 | 60 ft | -3.2 | - 7.8 | 0.3 | 251 |
| 25 | 80 ft | -4.0 | -10.5 | 0.2 | 82 |
| 26 | 100 ft | -3.8 | -13.2 | | |
| 27 | 120 ft | -4.4 | -15.8 | | |
| 28 | 140 ft | -4.6 | -18.7 | | |
| 29 | 160 ft | -5.2 | - 2.34 | | |
| 30 | 180 ft | -5.3 | - 2.43 | | |
| 31 | 200 ft | -5.8 | -26.9 | | |
| 32 | 225 ft | -7.1 | -30.5 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Date: 29 September 1964.
 Weapon No.: M16, serial No. 008651
 Cartridge: 5.56-mm, XM196.
 Distance from Rifle to Peg: 25 yards.
 Diameter of Peg: 1/2 inch.

Type of Wood: Birch.
 Round No.: 15.
 Velocity at 25 Feet, fps: 3017.
 Velocity at 55 Feet, fps: 2981.
 Bullet Hole in Peg: Vertical - +2.70.
 Horizontal - +0.05.

| Target No. | Distance Peg to Target | Bullet from Index Point, in. | | Bullet Hole | |
|------------|------------------------|------------------------------|------|---------------------------|--------------------------------|
| | | Vert | Hor | Length ^b , in. | Orientation ^b , deg |
| 1 | ^a 3.5 in. | -2.9 | 0 | | |
| 2 | 3 in. | -2.9 | 0.1 | | |
| 3 | 1 ft | -2.7 | 0.2 | | |
| 4 | 2 ft | -2.7 | 0.1 | | |
| 5 | 3 ft | -2.7 | 0.2 | | |
| 6 | 4 ft | -2.7 | 0.2 | | |
| 7 | 5 ft | -2.8 | 0.3 | | |
| 8 | 6 ft | -2.9 | 0.3 | | |
| 9 | 7 ft | -2.9 | 0.3 | | |
| 10 | 8 ft | -3.0 | 0.2 | | |
| 11 | 9 ft | -3.0 | 0.3 | | |
| 12 | 10 ft | -3.0 | 0.2 | | |
| 13 | 11 ft | -3.0 | 0.2 | | |
| 14 | 12 ft | -3.0 | 0.3 | | |
| 15 | 13 ft | -3.0 | 0.2 | | |
| 16 | 14 ft | -3.0 | 0.2 | | |
| 17 | 15 ft | -3.0 | 0.2 | | |
| 18 | 16 ft | -3.1 | 0.1 | | |
| 19 | 17 ft | -3.2 | 0.1 | | |
| 20 | 18 ft | -3.1 | 0.1 | | |
| 21 | 19 ft | -3.2 | 0 | | |
| 22 | 20 ft | -3.2 | -0.1 | | |
| 23 | 40 ft | -3.3 | -0.2 | | |
| 24 | 60 ft | -3.6 | -0.3 | | |
| 25 | 80 ft | -3.8 | -0.4 | | |
| 26 | 100 ft | -4.2 | -0.5 | | |
| 27 | 120 ft | -4.4 | -0.6 | | |
| 28 | 140 ft | -4.9 | -0.9 | | |
| 29 | 160 ft | -5.1 | -1.0 | | |
| 30 | 180 ft | -5.7 | -1.1 | | |
| 31 | 200 ft | -6.0 | -1.3 | | |
| 32 | 225 ft | -7.5 | -2.0 | | |

^aIn front of peg.

^bThe absence of measurements for length and orientation of bullet hole indicates there was no projectile yaw.

Summary

Weapon: M14, serial No. 1563467.
Ammunition: 7.62-mm, M62.

Rounds 1 through 5 missed peg.
Rounds 6 through 15 hit peg.

Weapon: M16, serial No. 008651.
Ammunition: 5.56-mm, XM196.

Rounds 1 through 5 missed peg.
Rounds 6 through 15 hit peg.

Accuracy Data

Legend

MR = Mean radius.
MHD = Mean horizontal dispersion.
MVD = Mean vertical dispersion.
EHD = Extreme horizontal dispersion.
EVD = Extreme vertical dispersion.
ES = Extreme spread.
H = Horizontal (Location of center of impact
V = Vertical from line of sight.)
Stand Dev = Standard deviation.
H = Horizontal.
V = Vertical.

Cartridge, 5.56-MM: Tracer, XM196, lot RA-223-115 (test).
Cartridge, 5.56-MM: Ball, M193, lot RA-5027 (control).

Notes: Targets 1 through 30 were fired at ranges of 100, 300, and 600 yards simultaneously.
Targets 31 through 45 were fired at beginning of erosion test.
Targets 46 through 60 were fired after 2000 rounds in erosion test.
Targets 61 through 75 were fired after 4000 rounds in erosion test.
Targets 76 through 90 were fired after 6000 rounds in erosion test.

| <u>Target</u> <u>No.</u> | <u>Rifle</u> <u>Rd No.</u> | <u>Type</u> <u>Ammo</u> |
|-----------------------------|-------------------------------|----------------------------|
|-----------------------------|-------------------------------|----------------------------|

Phase 2.2, Accuracy
(Simultaneously at 100, 300, and 600 yards)

Date Fired: 30 July 1964.
Rifle No.: 008625.

| | | |
|----|------------|--------|
| 1 | 41 to 50 | Ball |
| 2 | 51 to 60 | Tracer |
| 3 | 61 to 70 | Ball |
| 4 | 71 to 80 | Tracer |
| 5 | 81 to 90 | Ball |
| 6 | 91 to 100 | Tracer |
| 7 | 101 to 110 | Ball |
| 8 | 111 to 120 | Tracer |
| 9 | 121 to 130 | Ball |
| 10 | 131 to 140 | Tracer |

| <u>Target No.</u> | <u>Rifle Rd No.</u> | <u>Type Ammo</u> |
|----------------------------|-------------------------|----------------------|
| Date Fired: 4 August 1964. | | |
| Rifle No.: 023295. | | |
| 11 | 121 to 130 | Ball |
| 12 | 131 to 140 | Tracer |
| 13 | 141 to 150 | Ball |
| 14 | 151 to 160 | Tracer |
| 15 | 161 to 170 | Ball |
| 16 | 171 to 180 | Tracer |
| 17 | 181 to 190 | Ball |
| 18 | 191 to 200 | Tracer |
| 19 | 201 to 210 | Ball |
| 20 | 211 to 220 | Tracer |

Date Fired: 5 August 1964.
Rifle No.: 023348.

| | | |
|----|------------|--------|
| 21 | 21 to 30 | Ball |
| 22 | 31 to 40 | Tracer |
| 23 | 41 to 50 | Ball |
| 24 | 51 to 60 | Tracer |
| 25 | 61 to 70 | Ball |
| 26 | 71 to 80 | Tracer |
| 27 | 81 to 90 | Ball |
| 28 | 91 to 100 | Tracer |
| 29 | 101 to 110 | Ball |
| 30 | 111 to 120 | Tracer |

Phase 2.7, Erosion
(100 yards only)

Date Fired: 11 August 1964.
Rifle No.: 007721.

| | | |
|----|----------|------|
| 31 | 21 to 30 | Ball |
| 32 | 31 to 40 | Ball |
| 33 | 41 to 50 | Ball |
| 34 | 51 to 60 | Ball |
| 35 | 61 to 70 | Ball |

| <u>Target No.</u> | <u>Rifle Rd No.</u> | <u>Type Ammo</u> |
|---|-------------------------|----------------------|
| Date Fired: 11 August 1964. Rifle No.: 008651. | | |
| 36 | 21 to 30 | Tracer |
| 37 | 31 to 40 | Tracer |
| 38 | 41 to 50 | Tracer |
| 39 | 51 to 60 | Tracer |
| 40 | 61 to 70 | Tracer |
| Date Fired: 12 August 1964. Rifle No.: 007239. | | |
| 41 | 21 to 30 | Tracer |
| 42 | 31 to 40 | Tracer |
| 43 | 41 to 50 | Tracer |
| 44 | 51 to 60 | Tracer |
| 45 | 61 to 70 | Tracer |
| Date Fired: 14 August 1964. Rifle No.: 007239. | | |
| 46 | 2011 to 2020 | Tracer |
| 47 | 2021 to 2030 | Tracer |
| 48 | 2031 to 2040 | Tracer |
| 49 | 2041 to 2050 | Tracer |
| 50 | 2051 to 2060 | Tracer |
| Date Fired: 14 August 1964. Rifle No.: 007721. | | |
| 51 | 2011 to 2020 | Ball |
| 52 | 2021 to 2030 | Ball |
| 53 | 2031 to 2040 | Ball |
| 54 | 2041 to 2050 | Ball |
| 55 | 2051 to 2060 | Ball |
| Date Fired: 14 August 1965. Rifle No.: 008651. | | |
| 56 | 2011 to 2020 | Tracer |
| 57 | 2021 to 2030 | Tracer |
| 58 | 2031 to 2040 | Tracer |
| 59 | 2041 to 2050 | Tracer |
| 60 | 2051 to 2060 | Tracer |

| <u>Target No.</u> | <u>Rifle Rd No.</u> | <u>Type Ammo</u> |
|-----------------------------|-------------------------|----------------------|
| Date Fired: 18 August 1964. | | |
| Rifle No.: 007239. | | |
| 61 | 4011 to 4020 | Tracer |
| 62 | 4021 to 4030 | Tracer |
| 63 | 4031 to 4040 | Tracer |
| 64 | 4041 to 4050 | Tracer |
| 65 | 4051 to 4060 | Tracer |
| Date Fired: 18 August 1964. | | |
| Rifle No.: 007721. | | |
| 66 | 4011 to 4020 | Ball |
| 67 | 4021 to 4030 | Ball |
| 68 | 4031 to 4040 | Ball |
| 69 | 4041 to 4050 | Ball |
| 70 | 4051 to 4060 | Ball |
| Date Fired: 18 August 1964. | | |
| Rifle No.: 008651. | | |
| 71 | 4011 to 4020 | Tracer |
| 72 | 4021 to 4030 | Tracer |
| 73 | 4031 to 4040 | Tracer |
| 74 | 4041 to 4050 | Tracer |
| 75 | 4051 to 4060 | Tracer |
| Date Fired: 21 August 1964. | | |
| Rifle No.: 007239. | | |
| 76 | 5951 to 5960 | Tracer |
| 77 | 5961 to 5970 | Tracer |
| 78 | 5971 to 5980 | Tracer |
| 79 | 5981 to 5990 | Tracer |
| 80 | 5991 to 6000 | Tracer |
| Date Fired: 21 August 1964. | | |
| Rifle No.: 007721. | | |
| 81 | 5951 to 5960 | Ball |
| 82 | 5961 to 5970 | Ball |
| 83 | 5971 to 5980 | Ball |
| 84 | 5981 to 5990 | Ball |
| 85 | 5991 to 6000 | Ball |

| <u>Target No.</u> | <u>Rifle Rd No.</u> | <u>Type Ammo</u> |
|-----------------------------|-------------------------|----------------------|
| Date Fired: 21 August 1964. | | |
| Rifle No.: 008651. | | |
| 86 | 5951 to 5960 | Tracer |
| 87 | 5961 to 5970 | Tracer |
| 88 | 5971 to 5980 | Tracer |
| 89 | 5981 to 5990 | Tracer |
| 90 | 5991 to 6000 | Tracer |

| TGT NO. | RN | MND | AVD | BHD | EVD | ES | H | V | STAND | DEV |
|-------------------------|-----|-----|-----|-----|-----|-----|------|-----|-------|-----|
| | | | | | | | | | H | V |
| <u>RIFLE NO. 008625</u> | | | | | | | | | | |
| 1. | 1.3 | .6 | .9 | 3.8 | 3.9 | 4.2 | -2.6 | .7 | 1.0 | 1.2 |
| 2. | 1.1 | .6 | .6 | 2.5 | 2.1 | 3.2 | -2.2 | 1.1 | .9 | .9 |
| 5. | .9 | .8 | .3 | 3.3 | 1.8 | 3.2 | -2.5 | 2.6 | 1.0 | .5 |
| 7. | 1.2 | .5 | .9 | 2.1 | 2.3 | 3.3 | .0 | 3.9 | .7 | 1.2 |
| 9. | 1.5 | .7 | 1.1 | 2.5 | 4.6 | 4.7 | -4 | 5.2 | .9 | 1.5 |
| AVERAGE | 1.2 | .7 | .8 | 2.8 | 3.3 | 3.6 | -1.2 | 2.7 | .9 | 1.1 |
| <u>RIFLE NO. 022295</u> | | | | | | | | | | |
| 14. | 1.7 | 1.1 | 1.1 | 5.6 | 4.3 | 5.9 | -7 | 1.1 | 1.6 | 1.4 |
| 16. | 1.0 | .5 | .7 | 2.4 | 2.4 | 2.1 | .0 | 1.3 | .8 | .8 |
| 15. | 1.5 | .7 | 1.1 | 4.0 | 4.7 | 5.7 | .0 | 1.3 | 1.1 | 1.5 |
| 17. | 1.2 | .9 | .7 | 2.6 | 3.5 | 4.1 | .2 | .6 | 1.0 | 1.0 |
| 19. | 1.2 | .7 | .8 | 3.5 | 2.9 | 4.0 | -2 | .8 | 1.0 | 1.0 |
| AVERAGE | 1.3 | .9 | .9 | 3.7 | 3.6 | 4.5 | .0 | 1.0 | 1.1 | 1.1 |
| <u>RIFLE NO. 023346</u> | | | | | | | | | | |
| 21. | 1.1 | .5 | .9 | 2.2 | 2.3 | 3.6 | 2.1 | 2.9 | .7 | 1.1 |
| 23. | .8 | .5 | .7 | 1.5 | 2.5 | 2.6 | 2.4 | 2.4 | .5 | .8 |
| 25. | 1.1 | .4 | 1.0 | 2.2 | 3.4 | 2.5 | 2.8 | 2.7 | .6 | 1.2 |
| 27. | 1.0 | .7 | .5 | 2.0 | 2.5 | 2.9 | 2.7 | 2.8 | .9 | .7 |
| 29. | .8 | .5 | .5 | 2.1 | 1.9 | 2.8 | 3.0 | 2.7 | .7 | .6 |
| AVERAGE | 1.0 | .5 | .7 | 2.2 | 2.7 | 3.1 | 2.6 | 2.7 | .7 | .9 |

| TGT NO. | MR | MRD | MVD | MRD | RVD | ES | F | F | STAND DEV | |
|------------------|-----|-----|-----|------|------|----------------|------|----------------|-----------|-----|
| | | | | | | | | | H | Y |
| RIFLE NO. 008625 | | | | | | | | | | |
| | | | | | | RANGE 300 yds. | | TYPE AMMO BALL | | |
| 1. | 4.0 | 2.1 | 2.0 | 11.3 | 11.9 | 13.1 | -9.6 | -7.9 | 3.1 | 3.7 |
| 3. | 3.9 | 2.6 | 2.2 | 10.6 | 9.7 | 10.6 | -6.7 | -6.3 | 3.4 | 2.9 |
| 5. | 2.7 | 2.1 | 1.2 | 6.6 | 5.3 | 7.2 | -7 | -2.2 | 2.5 | 1.7 |
| 7. | 3.7 | 1.7 | 2.8 | 5.2 | 11.0 | 11.1 | -5 | 1.6 | 2.1 | 3.7 |
| 9. | 4.6 | 2.2 | 2.5 | 8.2 | 14.3 | 14.7 | -1.9 | 5.8 | 2.9 | 4.5 |
| MEAN | 3.8 | 2.2 | 2.5 | 8.6 | 10.5 | 11.2 | -3.7 | -1.8 | 2.8 | 3.3 |

| <u>RIFLE NO. 023295</u> | | | | | | | | | | |
|-------------------------|-----|-----|-----|------|------|------|-----|------|-----|-----|
| <u>RANGE 300 yds.</u> | | | | | | | | | | |
| <u>TYPE AMMO BALL</u> | | | | | | | | | | |
| 11. | 5.3 | 2.6 | 3.4 | 18.0 | 13.4 | 18.8 | .9 | -6.4 | 5.0 | 4.3 |
| 13. | 2.1 | 2.3 | 1.9 | 8.5 | 7.6 | 10.3 | .9 | -5.4 | 2.7 | 2.3 |
| 15. | 4.2 | 2.1 | 2.3 | 10.4 | 13.8 | 15.6 | 3.1 | -5.8 | 3.1 | 4.2 |
| 17. | 3.7 | 2.6 | 2.1 | 10.5 | 10.6 | 12.8 | 2.9 | -7.7 | 3.3 | 3.0 |
| 19. | 2.9 | 2.3 | 2.3 | 11.8 | 9.7 | 13.6 | -8 | -6.9 | 3.4 | 3.3 |
| MEAN | 4.0 | 2.6 | 2.7 | 11.8 | 11.0 | 14.2 | 1.4 | -6.4 | 3.5 | 3.4 |

| <u>RIFLE NO. 023246</u> | | | | | | | | | | |
|-------------------------|-----|-----|-----|------|-----|------|-----|------|-----|-----|
| <u>RANGE 300 yds.</u> | | | | | | | | | | |
| <u>TYPE AMC BALL</u> | | | | | | | | | | |
| 21. | 3.2 | 1.9 | 2.3 | 6.8 | 9.1 | 9.8 | 6.3 | -.9 | 2.2 | 2.9 |
| 23. | 2.6 | 1.7 | 2.0 | 6.0 | 7.3 | 7.9 | 6.3 | -2.4 | 2.1 | 2.4 |
| 25. | 3.2 | 1.6 | 2.6 | 6.6 | 9.9 | 11.5 | 9.0 | -1.4 | 2.1 | 3.3 |
| 27. | 2.5 | 2.5 | 1.3 | 12.2 | 7.8 | 12.5 | 2.0 | -.7 | 3.4 | 2.2 |
| 29. | 2.5 | 1.6 | 1.9 | 6.3 | 7.0 | 8.9 | 6.8 | -1.3 | 2.0 | 2.2 |
| MEAN | 3.0 | 1.8 | 2.1 | 7.6 | 8.2 | 10.1 | 7.9 | -1.3 | 2.4 | 2.6 |

| TGT NO. | MR | MHD | MVD | EHD | EVD | ES | H | V | STAND H | DEV V |
|------------------|------|-----|-----|------|------|------|-------|-------|------------|----------|
| RIFLE NO. 008625 | | | | | | | | | | |
| RANGE 600 yds. | | | | | | | | | | |
| TYPE AMMO Ball | | | | | | | | | | |
| 1. | 9.3 | 4.7 | 7.3 | 17.5 | 27.0 | 27.5 | -14.7 | -28.5 | 5.0 | 2.0 |
| 3. | 9.8 | 5.6 | 5.5 | 22.2 | 22.1 | 25.0 | -8.5 | -25.8 | 7.2 | 7.0 |
| 5. | 7.0 | 4.3 | 5.0 | 17.7 | 18.5 | 23.8 | 2.9 | -78.2 | 5.7 | 6.3 |
| 7. | 6.5 | 3.7 | 7.1 | 12.0 | 26.9 | 27.9 | 2.2 | -70.4 | 4.2 | 2.2 |
| 9. | 9.9 | 4.9 | 7.9 | 16.4 | 30.8 | 31.0 | .1 | -62.7 | 5.9 | 9.8 |
| MEAN | 8.7 | 4.6 | 6.6 | 17.2 | 25.0 | 27.0 | -2.6 | -77.2 | 5.8 | 8.3 |
| RIFLE NO. 022225 | | | | | | | | | | |
| RANGE 600 yds. | | | | | | | | | | |
| TYPE AMMO Ball | | | | | | | | | | |
| 11. | 11.7 | 7.3 | 7.9 | 33.3 | 33.9 | 43.9 | 9.7 | -69.1 | 10.2 | 10.4 |
| 13. | 7.7 | 7.4 | 4.1 | 21.7 | 15.2 | 23.1 | 5.5 | -66.2 | 6.9 | 5.0 |
| 15. | 7.7 | 4.7 | 5.5 | 21.0 | 22.5 | 26.4 | 11.4 | -69.9 | 3.8 | 7.1 |
| 17. | 0.3 | 5.1 | 5.3 | 22.3 | 24.1 | 27.3 | 11.4 | -90.4 | 7.0 | 7.0 |
| 19. | 9.9 | 4.5 | 6.2 | 24.0 | 25.2 | 28.5 | 1.0 | -80.0 | 6.9 | 9.7 |
| MEAN | 9.0 | 5.4 | 6.2 | 23.7 | 25.6 | 31.2 | 7.0 | -68.7 | 7.5 | 7.8 |
| RIFLE NO. 002240 | | | | | | | | | | |
| RANGE 600 yds. | | | | | | | | | | |
| TYPE AMMO Ball | | | | | | | | | | |
| 21. | 9.3 | 7.7 | 4.5 | 23.5 | 12.2 | 34.4 | 14.3 | -55.2 | 9.2 | 5.9 |
| 23. | 7.0 | 4.3 | 4.8 | 15.5 | 16.2 | 20.9 | 16.4 | -78.6 | 5.2 | 6.1 |
| 25. | 6.1 | 4.1 | 4.3 | 14.2 | 20.5 | 22.1 | 21.9 | -76.5 | 5.1 | 5.8 |
| 27. | 9.9 | 5.2 | 5.2 | 27.4 | 20.0 | 29.7 | -12.3 | -75.5 | 8.2 | 7.0 |
| 29. | 6.5 | 5.4 | 5.1 | 16.0 | 20.0 | 24.0 | 20.4 | -75.2 | 4.8 | 6.2 |
| MEAN | 7.5 | 5.1 | 5.0 | 20.3 | 19.5 | 26.2 | 11.9 | -74.2 | 6.5 | 6.2 |

| TGT NO. | WR | MHD | MVD | RHD | EVD | AS | H | V | STAND H | DEV V |
|------------|--------|-----|-----|-----|-----|----------|------|------|------------|----------|
| RIFLE NO. | 000625 | | | | | 100 yds. | | TYPE | AMC | Tracer |
| 2. | 1.5 | 1.1 | .8 | 4.7 | 3.8 | 4.7 | -1.6 | .4 | 1.4 | 1.1 |
| 4. | 2.1 | 1.2 | 1.5 | 5.1 | 5.0 | 5.7 | -1.8 | 2.4 | 1.6 | 1.8 |
| 6. | 1.4 | 1.1 | .8 | 4.8 | 2.7 | 5.5 | .3 | 3.6 | 1.4 | 1.0 |
| 8. | 1.7 | .8 | 1.4 | 2.6 | 5.4 | 5.6 | .5 | 4.2 | .9 | 1.7 |
| 10. | 1.7 | 1.1 | 1.1 | 4.6 | 4.0 | 4.6 | 1.0 | 5.8 | 1.4 | 1.4 |
| MEAN | 1.7 | 1.1 | 1.1 | 4.4 | 4.2 | 5.3 | -1.1 | 3.0 | 1.3 | 1.4 |
| RIFLE NO. | 022295 | | | | | 100 yds. | | TYPE | AMC | Tracer |
| 12. | 1.5 | .5 | 1.1 | 3.7 | 3.9 | 4.3 | .9 | -.6 | 1.1 | 1.4 |
| 14. | 1.6 | 1.0 | 1.1 | 3.8 | 3.5 | 4.3 | 1.2 | -.6 | 1.2 | 1.3 |
| 16. | 1.5 | .8 | 1.1 | 3.3 | 5.0 | 5.0 | .9 | .3 | 1.0 | 1.4 |
| 18. | 1.1 | .6 | .6 | 4.1 | 2.7 | 4.3 | .6 | -.1 | 1.1 | .9 |
| 20. | 1.5 | 1.1 | .9 | 4.1 | 3.2 | 4.3 | -1.5 | .2 | 1.3 | 1.0 |
| MEAN | 1.4 | .9 | .9 | 3.7 | 3.7 | 4.4 | .6 | -.2 | 1.1 | 1.2 |
| RIFLE NO. | 022240 | | | | | 100 yds. | | TYPE | AMC | Tracer |
| 22. | 1.5 | 1.2 | .9 | 4.5 | 3.0 | 5.4 | 1.7 | 4.2 | 1.5 | 1.1 |
| 24. | 2.1 | 1.0 | 1.6 | 4.5 | 3.2 | 6.7 | 2.9 | 3.3 | 1.5 | 2.2 |
| 26. | 1.7 | 1.0 | .9 | 3.7 | 3.3 | 4.0 | 1.9 | 2.1 | 1.3 | 1.1 |
| 28. | 1.3 | .7 | 1.0 | 3.2 | 5.2 | 5.5 | 2.8 | 3.7 | 1.0 | 1.5 |
| 30. | 2.2 | 1.2 | 1.5 | 4.5 | 8.9 | 9.1 | 2.5 | 4.3 | 1.5 | 2.3 |
| MEAN | 1.7 | 1.1 | 1.2 | 4.1 | 5.7 | 6.5 | 2.4 | 3.5 | 1.4 | 1.7 |

| TGT NC. | MR | MHD | MVD | EHD | EVD | ES | H | V | STAND DEV |
|-----------|--------|-----|-----|-------|----------|------|------|-----------|---------------|
| | | | | | | | | | $\frac{H}{V}$ |
| RIFLE NO. | 000625 | | | | | | | | |
| | | | | RANGE | 300 yds. | | | TYPE AMMO | Tracer |
| 2. | 4.4 | 3.1 | 2.2 | 14.8 | 10.7 | 14.8 | -4.9 | -8.2 | 4.2 3.0 |
| 4. | 6.3 | 3.5 | 4.7 | 14.5 | 14.6 | 16.2 | -2.4 | -2.2 | 4.5 5.5 |
| 6. | 4.2 | 3.2 | 2.2 | 14.2 | 8.0 | 16.2 | .3 | .6 | 4.2 2.7 |
| 8. | 5.5 | 3.0 | 4.3 | 9.5 | 16.0 | 17.5 | 1.6 | 3.9 | 2.5 5.2 |
| 10. | 5.7 | 3.9 | 3.4 | 14.9 | 12.2 | 14.9 | 2.2 | 7.9 | 4.9 4.3 |
| MEAN | 5.2 | 3.2 | 3.4 | 13.6 | 12.3 | 15.9 | -.6 | .4 | 4.2 4.1 |
| RIFLE NO. | 022295 | | | | | | | | |
| | | | | RANGE | 300 yds. | | | TYPE AMMO | Tracer |
| 12. | 5.0 | 2.5 | 2.6 | 11.6 | 12.4 | 12.7 | 5.1 | -10.2 | 2.5 4.2 |
| 14. | 3.2 | 2.7 | 2.2 | 12.6 | 11.9 | 14.4 | 4.4 | -11.5 | 4.3 4.0 |
| 16. | 4.5 | 2.4 | 3.0 | 10.4 | 16.0 | 16.2 | 4.6 | -8.9 | 3.1 4.3 |
| 18. | 3.4 | 2.2 | 2.2 | 10.4 | 9.7 | 10.8 | 3.9 | -9.6 | 3.1 2.8 |
| 20. | 5.0 | 3.5 | 2.9 | 12.4 | 9.6 | 14.8 | .4 | -8.5 | 4.4 3.5 |
| MEAN | 4.6 | 2.8 | 2.0 | 11.7 | 11.9 | 13.8 | 3.7 | -9.8 | 3.7 3.8 |
| RIFLE NO. | 022248 | | | | | | | | |
| | | | | RANGE | 300 yds. | | | TYPE AMMO | Tracer |
| 22. | 4.2 | 3.5 | 2.3 | 13.9 | 8.8 | 16.5 | 4.8 | 3.2 | 4.5 2.8 |
| 24. | 6.9 | 3.9 | 4.9 | 13.8 | 26.8 | 28.1 | 10.1 | 1.0 | 5.0 7.2 |
| 26. | 5.6 | 2.7 | 3.4 | 13.0 | 13.2 | 14.3 | 6.9 | -2.1 | 4.8 4.3 |
| 28. | 4.2 | 2.2 | 3.1 | 9.9 | 14.8 | 15.5 | 9.6 | 1.7 | 3.1 4.4 |
| 30. | 6.9 | 4.2 | 4.4 | 14.5 | 25.3 | 26.2 | 8.5 | 3.3 | 5.0 6.5 |
| MEAN | 5.6 | 3.5 | 3.6 | 13.0 | 17.8 | 20.1 | 8.0 | 1.4 | 4.5 5.0 |

| TGT NO. | NR | MRD | MRD | RND | RND | ES | H | V | STAND DEVI H | V |
|------------|--------|-----|------|-------|----------|------|------|----------|-----------------|------|
| RIFLE NO. | 008625 | | | RANGE | 600 yds. | | | TYPE ANG | Tracer | |
| 2. | 2.5 | 6.2 | 7.5 | 29.8 | 22.6 | 29.9 | -5.9 | -87.2 | 5.5 | 7.5 |
| 4. | 14.6 | 7.6 | 11.0 | 29.9 | 21.6 | 26.7 | -2.2 | -72.9 | 5.7 | 13.1 |
| 6. | 3.9 | 6.7 | 4.9 | 30.1 | 16.5 | 32.9 | 4.5 | -70.9 | 5.9 | 5.6 |
| 8. | 11.3 | 5.4 | 9.1 | 16.2 | 21.4 | 34.4 | 5.9 | -62.2 | 6.4 | 10.9 |
| 10. | 12.3 | 9.7 | 7.1 | 25.6 | 26.7 | 35.8 | 8.9 | -54.4 | 11.6 | 9.3 |
| MEAN | 11.5 | 7.1 | 7.6 | 28.3 | 25.8 | 34.0 | 2.6 | -69.7 | 9.1 | 9.3 |

| RIFLE NO. | 023295 | | | RANGE | 600 yds. | | | TYPE ANG | Tracer | |
|-----------|--------|-----|-----|-------|----------|------|------|----------|--------|------|
| 12. | 11.2 | 6.5 | 7.4 | 29.6 | 24.9 | 29.6 | 17.5 | -92.3 | 6.8 | 8.9 |
| 14. | 11.5 | 6.8 | 6.2 | 30.2 | 26.4 | 25.6 | 13.5 | -94.0 | 10.7 | 6.1 |
| 16. | 6.0 | 5.7 | 5.2 | 22.9 | 30.8 | 23.9 | 15.9 | -90.3 | 7.4 | 6.4 |
| 18. | 6.0 | 5.6 | 5.1 | 19.6 | 22.6 | 23.1 | 12.4 | -87.7 | 5.6 | 7.6 |
| 20. | 12.0 | 5.3 | 5.2 | 24.0 | 29.0 | 40.1 | 5.1 | -87.3 | 11.0 | 10.9 |
| MEAN | 10.5 | 6.0 | 6.6 | 27.6 | 27.0 | 32.4 | 10.9 | -90.4 | 8.7 | 8.6 |

| RIFLE NO. | 023240 | | | RANGE | 600 yds. | | | TYPE ANG | Tracer | |
|-----------|--------|-----|------|-------|----------|------|------|----------|--------|------|
| 22. | 5.9 | 4.6 | 2.9 | 15.5 | 10.7 | 15.6 | 15.4 | -76.2 | 5.5 | 3.4 |
| 24. | 12.5 | 7.2 | 10.1 | 26.4 | 57.4 | 58.8 | -6.3 | -70.5 | 9.2 | 14.7 |
| 26. | 12.7 | 6.4 | 7.5 | 29.3 | 26.2 | 31.7 | 17.4 | -75.6 | 10.7 | 9.9 |
| 28. | 9.0 | 5.9 | 7.0 | 19.6 | 27.5 | 30.9 | 23.0 | -66.0 | 7.1 | 6.8 |
| 30. | 11.1 | 5.0 | 6.0 | 22.0 | 27.3 | 37.3 | 22.2 | -67.0 | 10.9 | 10.7 |
| MEAN | 11.1 | 7.0 | 7.1 | 25.6 | 30.2 | 34.7 | 14.3 | -71.4 | 8.7 | 9.5 |

| TGT NO. | IR | MED | MVD | EHD | EVD | ES | H | V | STAND DEV |
|-----------|--------|-----|-----|-------|----------|-----|-----------|------|-----------|
| RIFLE NO. | 007721 | | | RANGE | 100 yds. | | TYPE AMMO | Ball | |
| 31. | 1.9 | 1.1 | 1.3 | 5.9 | 4.9 | 6.2 | 5.7 | 6.6 | 1.7 |
| 32. | 2.6 | 1.5 | 1.9 | 6.3 | 3.1 | 5.5 | 4.6 | 3.3 | 1.9 |
| 33. | 1.4 | .9 | .9 | 3.3 | 3.5 | 4.4 | 2.8 | 5.2 | 1.1 |
| 34. | 1.8 | .7 | 1.7 | 2.2 | 9.2 | 2.2 | 2.1 | 5.3 | .8 |
| 35. | 1.8 | .7 | 1.5 | 3.1 | 6.5 | 6.7 | 2.1 | 9.3 | .9 |
| MEAN | 1.9 | 1.0 | 1.4 | 4.2 | 6.5 | 7.2 | 3.5 | 5.3 | 1.3 |

| RIFLE NO. | 003651 | | | RANGE | 100 yds. | | TYPE AMMO | Tracer | |
|-----------|--------|-----|-----|-------|----------|-----|-----------|--------|-----|
| 36. | 1.6 | 1.0 | 1.0 | 3.5 | 4.2 | 4.8 | 4.2 | 4.3 | 1.3 |
| 37. | 1.1 | .9 | .5 | 3.1 | 2.2 | 3.5 | 4.1 | 2.3 | 1.1 |
| 38. | 1.5 | .9 | 1.1 | 3.2 | 4.5 | 5.0 | 4.5 | 2.5 | 1.1 |
| 39. | 1.4 | .3 | 1.0 | 3.7 | 5.2 | 5.3 | 4.3 | 2.4 | 1.1 |
| 40. | 1.5 | .9 | 1.0 | 3.3 | 3.4 | 4.1 | 4.5 | 2.4 | 1.2 |
| MEAN | 1.4 | .0 | .2 | 3.5 | 3.9 | 4.5 | 4.3 | 2.9 | 1.2 |

| RIFLE NO. | 007239 | | | RANGE | 100 yds. | | TYPE AMMO | Tracer | |
|-----------|--------|-----|-----|-------|----------|-----|-----------|--------|-----|
| 41. | 1.2 | .9 | .7 | 2.5 | 2.5 | 3.0 | 4.3 | 1.7 | 1.0 |
| 42. | 1.9 | 1.3 | 1.2 | 6.3 | 5.0 | 7.7 | 3.8 | 2.9 | 1.8 |
| 43. | 1.7 | .9 | 1.2 | 2.8 | 5.3 | 5.3 | 3.3 | 1.4 | 1.1 |
| 44. | 1.9 | 1.0 | 1.4 | 5.5 | 4.9 | 7.1 | 3.7 | 1.7 | 1.5 |
| 45. | 1.6 | 1.2 | .9 | 5.0 | 4.0 | 5.1 | 5.0 | .5 | 1.6 |
| MEAN | 1.7 | 1.1 | 1.1 | 4.5 | 4.3 | 5.6 | 4.0 | 1.6 | 1.4 |

| TGT NO. | MR | MJD | MVD | EHD | EVD | ES | H | V | STAND | DEV |
|-----------|--------|-----|-----|-----|-----|-----|------|------|-------|-----|
| RIFLE NO. | 007239 | | | | | | | | | |
| 46. | 1.4 | .7 | 1.0 | 3.4 | 3.5 | 3.7 | -1.0 | 3.8 | 1.0 | 1.2 |
| 47. | 1.5 | 1.1 | .3 | 3.9 | 3.5 | 4.3 | -4.1 | 4.1 | 1.3 | 1.1 |
| 48. | 2.1 | 1.2 | 1.5 | 4.3 | 4.7 | 6.0 | -3.2 | 4.2 | 1.6 | 1.7 |
| 49. | 1.2 | .7 | .3 | 3.0 | 3.5 | 3.5 | -3.3 | 3.8 | .9 | 1.0 |
| 50. | 1.7 | 1.3 | .9 | 4.2 | 3.9 | 4.7 | -4.5 | 4.6 | 1.5 | 1.2 |
| MEAN | 1.6 | 1.0 | 1.0 | 3.8 | 3.8 | 4.4 | -3.8 | 4.1 | 1.3 | 1.2 |
| RIFLE NO. | 007721 | | | | | | | | | |
| 51. | 1.1 | .3 | .7 | 3.4 | 3.5 | 4.8 | 7.1 | -2 | 1.0 | 1.0 |
| 52. | 1.0 | .6 | .6 | 3.0 | 2.0 | 3.0 | 5.7 | -1.8 | .9 | .7 |
| 53. | 1.2 | .3 | .3 | 3.6 | 3.8 | 3.9 | 5.7 | -7 | 1.0 | 1.1 |
| 53. | 1.6 | .6 | 1.2 | 2.3 | 5.4 | 5.4 | 5.5 | .2 | .8 | 1.7 |
| 55. | .9 | .5 | .6 | 2.0 | 2.3 | 3.0 | 5.6 | -3 | .8 | .7 |
| MEAN | 1.2 | .7 | .8 | 3.0 | 3.4 | 4.0 | 5.9 | -7 | .9 | 1.0 |
| RIFLE NO. | 008651 | | | | | | | | | |
| 56. | 1.7 | 1.2 | 1.0 | 3.4 | 4.3 | 5.0 | 5.4 | 9.8 | 1.4 | 1.3 |
| 57. | 1.5 | 1.1 | .9 | 3.8 | 3.5 | 4.4 | 4.3 | 10.4 | 1.3 | 1.1 |
| 58. | 1.3 | .5 | 1.1 | 1.3 | 3.8 | 3.8 | 4.0 | 10.7 | .7 | 1.3 |
| 59. | 1.4 | 1.1 | .7 | 4.7 | 2.2 | 4.7 | 5.3 | 12.0 | 1.4 | .8 |
| 60. | 2.1 | 1.2 | 1.4 | 4.2 | 5.5 | 5.6 | 6.8 | 11.6 | 1.4 | 1.7 |
| MEAN | 1.6 | 1.0 | 1.0 | 3.6 | 4.0 | 4.7 | 5.2 | 10.9 | 1.2 | 1.2 |

| TGT NO. | MR | MGD | MVD | EHD | EVC | ES | H | V | STAND | DSV |
|-----------|--------|-----|-----|-------|----------|-----|------|----------|-------|--------|
| RIFLE NO. | CC7239 | | | RANGE | 100 yds. | | | TYPE AND | H | V |
| 61. | 1.2 | .6 | 1.1 | 2.6 | 4.0 | 4.3 | 4.4 | 10.0 | .3 | 1.4 |
| 62. | 1.5 | 1.0 | 1.0 | 2.9 | 3.7 | 4.6 | 3.6 | 10.3 | 1.1 | 1.2 |
| 63. | 1.6 | 1.0 | 1.0 | 3.0 | 3.7 | 3.9 | 4.2 | 10.5 | 1.2 | 1.3 |
| 64. | 1.5 | 1.2 | .3 | 4.7 | 4.1 | 4.7 | 2.3 | 9.7 | 1.4 | 1.2 |
| 65. | 1.4 | 1.0 | 1.0 | 3.5 | 4.6 | 5.5 | 3.2 | 10.7 | 1.2 | 1.3 |
| MEAN | 1.5 | 1.0 | 1.0 | 3.3 | 4.0 | 4.7 | 3.6 | 10.2 | 1.1 | 1.3 |
| RIFLE NO. | CC7721 | | | RANGE | 100 yds. | | | TYPE AND | | Ball |
| 66. | 1.3 | .3 | .9 | 3.6 | 4.5 | 4.3 | 4.0 | 3.0 | 1.0 | 1.2 |
| 67. | 1.2 | .9 | .5 | 3.7 | 2.6 | 3.7 | 3.1 | 2.3 | 1.1 | .3 |
| 68. | 1.0 | .6 | .7 | 2.6 | 1.7 | 2.9 | 2.5 | 1.3 | .3 | .3 |
| 69. | 1.1 | .7 | .3 | 2.3 | 3.4 | 3.6 | 2.7 | 2.7 | .3 | 1.0 |
| 70. | 1.1 | .7 | .9 | 2.6 | 3.3 | 3.5 | 2.6 | 2.2 | .9 | 1.1 |
| MEAN | 1.2 | .7 | .3 | 3.0 | 3.1 | 3.8 | 3.0 | 2.4 | .9 | 1.0 |
| RIFLE NO. | CC8651 | | | RANGE | 100 yds. | | | TYPE AND | | Tracer |
| 71. | 1.3 | 1.1 | 1.3 | 3.7 | 5.2 | 5.7 | -3.2 | 9.7 | 1.2 | 1.7 |
| 72. | 1.2 | .3 | .7 | 2.9 | 3.3 | 3.4 | -9.4 | 10.9 | 1.0 | 1.0 |
| 73. | 1.2 | .6 | .3 | 2.6 | 3.9 | 3.9 | -9.4 | 10.3 | .3 | 1.1 |
| 74. | 1.3 | .7 | .9 | 3.5 | 4.5 | 4.5 | -3.3 | 9.4 | 1.0 | 1.3 |
| 75. | 1.2 | .9 | .6 | 3.9 | 2.7 | 3.9 | -3.5 | 10.1 | 1.2 | .9 |
| MEAN | 1.3 | .3 | .9 | 3.3 | 3.9 | 4.3 | -3.3 | 10.2 | 1.0 | 1.2 |

| TGT NO. | RA | REL | WZ | SHD | EVZ | ES | H | 7 | STATE |
|-----------|--------|-----|-----|-------|----------|-----|------|------|--------|
| RIFLE NO. | 007221 | | | RANGE | 100 yds. | | | TYPE | TRACER |
| 76. | 1.7 | 1.4 | .7 | 4.0 | 5.0 | 5.7 | 3.3 | .3 | 1.5 |
| 77. | 1.2 | .7 | .6 | 3.3 | 2.3 | 4.3 | 3.5 | 1.7 | 1.0 |
| 78. | 1.5 | 1.2 | .6 | 5.1 | 3.2 | 6.0 | 1.3 | 1.6 | .9 |
| 79. | 1.7 | 1.5 | .6 | 4.9 | 2.3 | 4.9 | 3.2 | 1.4 | .3 |
| 80. | 1.2 | 1.2 | .6 | 4.2 | 1.6 | 4.5 | 3.5 | 2.7 | .6 |
| MEAN | 1.4 | 1.1 | .7 | 4.6 | 3.1 | 5.1 | 3.5 | 1.6 | .9 |
| RIFLE NO. | 007721 | | | RANGE | 100 yds. | | | TYPE | Ball |
| 31. | 1.4 | .7 | 1.0 | 3.5 | 6.0 | 6.4 | -2.2 | 1.3 | 1.0 |
| 32. | 1.6 | .6 | 1.3 | 4.5 | 5.9 | 5.3 | -1.5 | 2.1 | 1.2 |
| 33. | 1.1 | .7 | .7 | 3.2 | 2.6 | 3.6 | -2.3 | .7 | 1.0 |
| 34. | 1.1 | .7 | .7 | 2.4 | 2.7 | 2.3 | -3.2 | 1.4 | .3 |
| 35. | 1.1 | .5 | .3 | 1.7 | 1.1 | 1.1 | -2.9 | 2.2 | .6 |
| MEAN | 1.2 | .6 | .9 | 3.2 | 4.2 | 4.7 | -2.6 | 1.6 | .9 |
| RIFLE NO. | 008021 | | | RANGE | 100 yds. | | | TYPE | Tracer |
| 36. | 1.2 | 1.0 | 1.1 | 3.9 | 4.1 | 4.3 | -3.9 | 4.2 | 1.3 |
| 37. | 1.3 | 1.1 | .6 | 3.2 | 2.6 | 4.6 | -4.1 | 3.7 | 1.3 |
| 38. | 1.3 | .9 | 1.3 | 3.2 | 6.6 | 6.6 | -4.9 | 5.0 | 1.2 |
| 39. | 1.6 | 1.1 | 1.1 | 3.5 | 3.5 | 4.3 | -4.9 | 5.5 | 1.3 |
| 40. | 1.5 | 1.0 | .9 | 3.5 | 4.3 | 5.0 | -5.9 | 5.1 | 1.2 |
| MEAN | 1.6 | 1.0 | 1.0 | 3.7 | 4.2 | 5.0 | -4.8 | 4.7 | 1.3 |

Velocity Data
for Erosion Phase

| <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> |
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|

Ammunition: XM196.
Rifle No.: 007239.

| | | | | | | | | | |
|-----|------|----|------|----|------|----|------|----|------|
| 21 | 3125 | 31 | 3155 | 41 | 3185 | 51 | 3175 | 61 | 3115 |
| 22 | 3175 | 32 | 3155 | 42 | 3135 | 52 | 3135 | 62 | 3067 |
| 23 | 3106 | 33 | 3135 | 43 | 3125 | 53 | 3125 | 63 | 3195 |
| 24 | 3155 | 34 | 3155 | 44 | 3049 | 54 | 3135 | 64 | 3115 |
| 25 | 3135 | 35 | 3175 | 45 | 3215 | 55 | 3145 | 65 | 3125 |
| 26 | 3175 | 36 | 3155 | 46 | 3049 | 56 | 3165 | 66 | 3106 |
| 27 | 3155 | 37 | 3155 | 47 | 3106 | 57 | 3086 | 67 | 3135 |
| 28 | 3165 | 38 | 3125 | 48 | 3155 | 58 | 3155 | 68 | 3135 |
| 29 | 3145 | 39 | 3096 | 49 | 3175 | 59 | 3155 | 69 | 3135 |
| 30 | 3106 | 40 | 3155 | 50 | 3106 | 60 | 3106 | 70 | 3175 |
| Avg | 3144 | | 3146 | | 3130 | | 3138 | | 3130 |

Ammunition: M193.
Rifle No.: 007721.

| | | | | | | | | | |
|-----|------|----|------|----|------|----|------|----|------|
| 21 | 3106 | 31 | 3106 | 41 | 3215 | 51 | 3115 | 61 | 3165 |
| 22 | 3077 | 32 | 3058 | 42 | 3115 | 52 | 3086 | 62 | 3155 |
| 23 | 3096 | 33 | 3077 | 43 | 3086 | 53 | 3106 | 63 | 3195 |
| 24 | 3049 | 34 | 3106 | 44 | 3175 | 54 | 3125 | 64 | 3195 |
| 25 | 3145 | 35 | 3067 | 45 | 3175 | 55 | 3040 | 65 | 3195 |
| 26 | 3086 | 36 | 3086 | 46 | 3049 | 56 | 3135 | 66 | 3125 |
| 27 | 3077 | 37 | 3125 | 47 | 3106 | 57 | 3165 | 67 | 3096 |
| 28 | 3106 | 38 | 3106 | 48 | 3155 | 58 | 3125 | 68 | 3058 |
| 29 | 3125 | 39 | 3135 | 49 | 3175 | 59 | 3135 | 69 | 3185 |
| 30 | 3040 | 40 | 3049 | 50 | 3115 | 60 | 3125 | 70 | 3135 |
| Avg | 3091 | | 3092 | | 3136 | | 3116 | | 3150 |

Ammunition: XM196.
Rifle No.: 008651.

| | | | | | | | | | |
|-----|------|----|------|----|------|----|------|----|------|
| 21 | 3155 | 31 | 3115 | 41 | 3155 | 51 | 3155 | 61 | 3077 |
| 22 | 3106 | 32 | 3106 | 42 | 3096 | 52 | 3096 | 62 | 3115 |
| 23 | 3135 | 33 | 3175 | 43 | 3135 | 53 | 3096 | 63 | 3175 |
| 24 | 3135 | 34 | 3067 | 44 | 3165 | 54 | 3155 | 64 | 3135 |
| 25 | 3145 | 35 | 3086 | 45 | 3165 | 55 | 3077 | 65 | 3155 |
| 26 | 3115 | 36 | 3106 | 46 | 3067 | 56 | 3125 | 66 | 3125 |
| 27 | 3115 | 37 | 3135 | 47 | 3145 | 57 | 3125 | 67 | 3058 |
| 28 | 3106 | 38 | 3115 | 48 | 3175 | 58 | 3077 | 68 | 3115 |
| 29 | 3145 | 39 | 3106 | 49 | 3106 | 59 | 3175 | 69 | 3077 |
| 30 | 3106 | 40 | 3175 | 50 | 3155 | 60 | 3205 | 70 | 3106 |
| Avg | 3126 | | 3119 | | 3136 | | 3129 | | 3114 |

| <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> |
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|

Ammunition: XM196.
Rifle No.: 007239.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 2011 | 3096 | 2021 | 3049 | 2031 | 3106 | 2041 | 3115 | 2051 | 3086 |
| 2012 | 3165 | 2022 | 3115 | 2032 | 3125 | 2042 | 3135 | 2052 | 3067 |
| 2013 | 3067 | 2023 | 3125 | 2033 | 3125 | 2043 | 3145 | 2053 | 3125 |
| 2014 | 3040 | 2024 | 3067 | 2034 | 3096 | 2044 | 3165 | 2054 | 3096 |
| 2015 | 3077 | 2025 | 3115 | 2035 | 3125 | 2045 | 3115 | 2055 | 3115 |
| 2016 | 3077 | 2026 | 3115 | 2036 | 3155 | 2046 | 3125 | 2056 | 3067 |
| 2017 | 3086 | 2027 | 3106 | 2037 | 3165 | 2047 | 3165 | 2057 | 3106 |
| 2018 | 3040 | 2028 | 3086 | 2038 | 3115 | 2048 | 3125 | 2058 | 3185 |
| 2019 | 3125 | 2029 | 3086 | 2039 | 3125 | 2049 | 3135 | 2059 | 3135 |
| 2020 | 3125 | 2030 | 3086 | 2040 | 3155 | 2050 | 3115 | 2060 | 3067 |
| Avg | 3090 | | 3095 | | 3129 | | 3134 | | 3105 |

Ammunition: M193.
Rifle No.: 007721.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 2011 | 3096 | 2021 | 3135 | 2031 | 3145 | 2041 | 3145 | 2051 | 3086 |
| 2012 | 3058 | 2022 | 3135 | 2032 | 3086 | 2042 | 3145 | 2052 | 3086 |
| 2013 | 3106 | 2023 | 3086 | 2033 | 3096 | 2043 | 3058 | 2053 | 3125 |
| 2014 | 3115 | 2024 | 3155 | 2034 | 3155 | 2044 | 3115 | 2054 | 3165 |
| 2015 | 3086 | 2025 | 3115 | 2035 | 3175 | 2045 | 3145 | 2055 | 3145 |
| 2016 | 3115 | 2026 | 3155 | 2036 | 3155 | 2046 | 3125 | 2056 | 3145 |
| 2017 | 3086 | 2027 | 3135 | 2037 | 3155 | 2047 | 3077 | 2057 | 3096 |
| 2018 | 3115 | 2028 | 3106 | 2038 | 3106 | 2048 | 3145 | 2058 | 3049 |
| 2019 | 3135 | 2029 | 3145 | 2039 | 3106 | 2049 | 3135 | 2059 | 3155 |
| 2020 | 3165 | 2030 | 3155 | 2040 | 3145 | 2050 | 3125 | 2060 | 3145 |
| Avg | 3108 | | 3132 | | 3132 | | 3122 | | 3120 |

Ammunition: XM196.
Rifle No.: 008651.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 2011 | 3115 | 2021 | 3086 | 2031 | 3175 | 2041 | 3096 | 2051 | 3145 |
| 2012 | 3145 | 2022 | 3125 | 2032 | 3106 | 2042 | 3096 | 2052 | 3135 |
| 2013 | 3106 | 2023 | 3086 | 2033 | 3106 | 2043 | 3077 | 2053 | 3135 |
| 2014 | 3115 | 2024 | 3067 | 2034 | 3135 | 2044 | 3106 | 2054 | 3155 |
| 2015 | 3145 | 2025 | 3058 | 2035 | 3125 | 2045 | 3077 | 2055 | 3058 |
| 2016 | 3067 | 2026 | 3077 | 2036 | 3106 | 2046 | 3106 | 2056 | 3096 |
| 2017 | 3096 | 2027 | 3106 | 2037 | 3106 | 2047 | 3115 | 2057 | 3155 |
| 2018 | 3096 | 2028 | 3077 | 2038 | 3106 | 2048 | 3077 | 2058 | 3106 |
| 2019 | 3096 | 2029 | 3086 | 2039 | 3115 | 2049 | 3086 | 2059 | 3115 |
| 2020 | 3135 | 2030 | 3125 | 2040 | 3185 | 2050 | 3115 | 2060 | 3086 |
| Avg | 3112 | | 3089 | | 3127 | | 3095 | | 3119 |

| <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> |
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|

Ammunition: XM196.
Rifle No.: 007239.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 4011 | 3049 | 4021 | 3067 | 4031 | 3067 | 4041 | 3115 | 4051 | 3145 |
| 4012 | 3040 | 4022 | 3067 | 4032 | 3049 | 4042 | 3125 | 4052 | 3049 |
| 4013 | 3077 | 4023 | 3077 | 4033 | 3086 | 4043 | 3058 | 4053 | 3049 |
| 4014 | 3106 | 4024 | 3067 | 4034 | 3067 | 4044 | 3106 | 4054 | 3115 |
| 4015 | 3058 | 4025 | 3096 | 4035 | 3077 | 4045 | 3115 | 4055 | 3096 |
| 4016 | 3106 | 4026 | 3125 | 4036 | 3106 | 4046 | 3115 | 4056 | 3135 |
| 4017 | 3106 | 4027 | 3106 | 4037 | 3058 | 4047 | 3115 | 4057 | 3086 |
| 4018 | 3115 | 4028 | 3086 | 4038 | 3096 | 4048 | 3086 | 4058 | 3049 |
| 4019 | 3106 | 4029 | 3106 | 4039 | 3077 | 4049 | 3067 | 4059 | 3115 |
| 4020 | 3067 | 4030 | 3077 | 4040 | 3106 | 4050 | 3077 | 4060 | 3106 |
| Avg | 3083 | | 3087 | | 3079 | | 3098 | | 3095 |

Ammunition: M193.
Rifle No.: 007721.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 4011 | 3003 | 4021 | 3040 | 4031 | 3086 | 4041 | 3067 | 4051 | 3125 |
| 4012 | 3049 | 4022 | 3049 | 4032 | 3106 | 4042 | 3030 | 4052 | 3096 |
| 4013 | 3049 | 4023 | 3049 | 4033 | 3058 | 4043 | 3058 | 4053 | 3040 |
| 4014 | 3058 | 4024 | 3185 | 4034 | 3077 | 4044 | 3058 | 4054 | 3125 |
| 4015 | 3077 | 4025 | 3021 | 4035 | 3067 | 4045 | 3058 | 4055 | 3106 |
| 4016 | 3012 | 4026 | 3058 | 4036 | 3049 | 4046 | 3077 | 4056 | 3058 |
| 4017 | 3077 | 4027 | 3021 | 4037 | 3012 | 4047 | 3096 | 4057 | 3077 |
| 4018 | 3058 | 4028 | 3067 | 4038 | 3096 | 4048 | 3012 | 4058 | 3115 |
| 4019 | 2967 | 4029 | 3096 | 4039 | 3040 | 4049 | 3049 | 4059 | 3067 |
| 4020 | 3067 | 4030 | 3135 | 4040 | 3012 | 4050 | 3058 | 4060 | 3077 |
| Avg | 3042 | | 3072 | | 3060 | | 3056 | | 3089 |

Ammunition: XM196.
Rifle No.: 008651.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 4011 | 3030 | 4021 | 2976 | 4031 | 3040 | 4041 | 3058 | 4051 | 3049 |
| 4012 | 3077 | 4022 | 3021 | 4032 | 3040 | 4042 | 3058 | 4052 | 3021 |
| 4013 | 3012 | 4023 | 3040 | 4033 | 2994 | 4043 | 3021 | 4053 | 3058 |
| 4014 | 3003 | 4024 | 2967 | 4034 | 2994 | 4044 | 3125 | 4054 | 3077 |
| 4015 | 3030 | 4025 | 3086 | 4035 | 3040 | 4045 | 3086 | 4055 | 3030 |
| 4016 | 3030 | 4026 | 3058 | 4036 | 3012 | 4046 | 3086 | 4056 | 3058 |
| 4017 | 3096 | 4027 | 3067 | 4037 | 3040 | 4047 | 3067 | 4057 | 3021 |
| 4018 | 3021 | 4028 | 3040 | 4038 | 3067 | 4048 | 3003 | 4058 | 3086 |
| 4019 | 3040 | 4029 | 3040 | 4039 | 3086 | 4049 | 3086 | 4059 | 3040 |
| 4020 | 3096 | 4030 | 3049 | 4040 | 3021 | 4050 | 3067 | 4060 | 3021 |
| Avg | 3044 | | 3034 | | 3033 | | 3066 | | 3046 |

| <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> | <u>Rd</u> <u>No.</u> | <u>Vel,</u> <u>fps</u> |
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|---------------------------|

Ammunition: XM196.
Rifle No.: 007239.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 5951 | 3021 | 5961 | 3030 | 5971 | 3096 | 5981 | 3086 | 5991 | 3135 |
| 5952 | 3030 | 5962 | 3086 | 5972 | 3030 | 5982 | 3086 | 5992 | 3086 |
| 5953 | 3077 | 5963 | 3058 | 5973 | 3030 | 5983 | 3077 | 5993 | 3040 |
| 5954 | 3106 | 5964 | 3058 | 5974 | 3115 | 5984 | 3077 | 5994 | 3115 |
| 5955 | 3115 | 5965 | 3040 | 5975 | 3096 | 5985 | 3086 | 5995 | 3030 |
| 5956 | 3030 | 5966 | 3049 | 5976 | 3135 | 5986 | 3067 | 5996 | 3047 |
| 5957 | 3086 | 5967 | 3115 | 5977 | 3049 | 5987 | 3077 | 5997 | 3067 |
| 5958 | 3040 | 5968 | 3086 | 5978 | 3115 | 5988 | 3077 | 5998 | 3125 |
| 5959 | 3086 | 5969 | 2959 | 5979 | 3096 | 5989 | 3040 | 5999 | 3077 |
| 5960 | 3077 | 5970 | 3086 | 5980 | 3096 | 5990 | 3049 | 6000 | 3115 |
| Avg | 3066 | | 3057 | | 3086 | | 3072 | | 3084 |

Ammunition: M193.
Rifle No.: 007721.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 5951 | 3030 | 5961 | 2994 | 5971 | 3058 | 5981 | 3067 | 5991 | 3096 |
| 5952 | 2976 | 5962 | 3096 | 5972 | 3106 | 5982 | 3049 | 5992 | 3086 |
| 5953 | 3012 | 5963 | 3067 | 5973 | 3040 | 5983 | 3021 | 5993 | 3030 |
| 5954 | 3003 | 5964 | 3058 | 5974 | 3047 | 5984 | 3096 | 5994 | 3077 |
| 5955 | 3086 | 5965 | 3030 | 5975 | 3086 | 5985 | 3040 | 5995 | 2994 |
| 5956 | 3012 | 5966 | 3077 | 5976 | 3125 | 5986 | 3067 | 5996 | 3058 |
| 5957 | 3086 | 5967 | 2976 | 5977 | 3096 | 5987 | 3077 | 5997 | 3067 |
| 5958 | 3047 | 5968 | 3030 | 5978 | 3077 | 5988 | 3021 | 5998 | 3049 |
| 5959 | 3003 | 5969 | 3106 | 5979 | 3077 | 5989 | 3067 | 5999 | 3030 |
| 5960 | 3058 | 5970 | 3077 | 5980 | 3106 | 5990 | 3077 | 6000 | 3058 |
| Avg | 3031 | | 3051 | | 3082 | | 3058 | | 3055 |

Ammunition: XM196.
Rifle No.: 008651.

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 5951 | 2994 | 5961 | 3021 | 5971 | 2994 | 5981 | 3067 | 5991 | 3021 |
| 5952 | 3003 | 5962 | 3003 | 5972 | 2994 | 5982 | 3040 | 5992 | 3077 |
| 5953 | 2985 | 5963 | 3030 | 5973 | 3086 | 5983 | 2967 | 5993 | 3003 |
| 5954 | 3086 | 5964 | 3049 | 5974 | 3058 | 5984 | 2994 | 5994 | 2994 |
| 5955 | 2985 | 5965 | 3030 | 5975 | 3049 | 5985 | 3077 | 5995 | 3021 |
| 5956 | 3003 | 5966 | 3040 | 5976 | 2976 | 5986 | 3106 | 5996 | 3077 |
| 5957 | 2985 | 5967 | 3049 | 5977 | 2985 | 5987 | 2994 | 5997 | 3012 |
| 5958 | 3096 | 5968 | 3021 | 5978 | 3077 | 5988 | 3049 | 5998 | 3049 |
| 5959 | 2907 | 5969 | 3058 | 5979 | 3040 | 5989 | 3086 | 5999 | 3003 |
| 5960 | 2941 | 5970 | 3049 | 5980 | 3058 | 5990 | 3058 | 6000 | 3067 |
| Avg | 2999 | | 3035 | | 3032 | | 3054 | | 3032 |

MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

| DATE OF GAUGING | | FIRING STATUS (Check One) | | NUMBER | MODEL | MANUFACTURER | CASTING NUMBER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------------|---------------------------|----------------|------------------|--------------------|--------------|----------------|--------------------------|---------------------------|--|--|--|--------------|--|----------------|--|--|------|-----|------|-----|------|------|-----|-----|-----|------|--|--|--|--|------|--|--|--|--|------|--|--|--|--|------|--|--|--|--|------|--|--|--|--|------|--|--|--|--|------|--|--|--|--|------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|--|--|--|--|-------|-----|---|---|---|-------|---|-----|---|---|-------|-------|-------|-------|-------|
| Cal. .223" (4) | | BEFORE | | 007239 | BLAR 15 | (611) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 AUG 1964 | | AFTER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIELE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DATE OF GAUGING | | FIRING STATUS (Check One) | | NUMBER OF ROUNDS | PROOF OFFICER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 AUG 1964 | | BEFORE | | BEAT HUG. | LINDLEY 331-617-40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Barrel-Gaging Data</p> <p>(611, 223" (4) BLAR 15)</p> <p>DIST. IN INCHES FROM</p> <table border="1"> <thead> <tr> <th rowspan="2">FACE OF FLASH SUPPRESSOR</th> <th colspan="4">GAGE MEAS. IN 1/1000 INCH</th> </tr> <tr> <th colspan="2">LANDS .2190"</th> <th colspan="2">GROOVES .2235"</th> </tr> <tr> <th></th> <th>VERT</th> <th>HOR</th> <th>VERT</th> <th>HOR</th> </tr> </thead> <tbody> <tr> <td>1.25</td> <td>.000</td> <td>.00</td> <td>.00</td> <td>.00</td> </tr> <tr> <td>2.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>13.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>14.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>15.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>16.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>17.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>18.00</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>18.33</td> <td>+ 1</td> <td>0</td> <td>2</td> <td>4</td> </tr> <tr> <td>18.83</td> <td>1</td> <td>+ 1</td> <td>2</td> <td>4</td> </tr> <tr> <td>19.10</td> <td>+0001</td> <td>+0002</td> <td>+0002</td> <td>+0003</td> </tr> </tbody> </table> <p>REAR FACE OF RECILINR</p> <p>GAGE NOT HEAVY DUE TO METAL DEPOSITS</p> <p>ENTER METAL DEPOSITS</p> <p>WICK</p> <p>PROPOSED -</p> <p>Original gage that makes in straight chamber and forcing cone. Light 300 loading on rear edge of forcing cone. Slope of chamber roughly finished. Lands and grooves chambered intermittently throughout bore. Light deposits of metal in bore from 19.00 to 16" from muzzle face of chamber. Heavy deposits of metal throughout remainder of bore. This condition was pronounced. Lands and at base of lands. Forward edge of grooves not unduly eroded. of 9.00</p> <p>Twist of rifling 1 turn in 12 inches</p> <p>HCO</p> | | | | | | | | FACE OF FLASH SUPPRESSOR | GAGE MEAS. IN 1/1000 INCH | | | | LANDS .2190" | | GROOVES .2235" | | | VERT | HOR | VERT | HOR | 1.25 | .000 | .00 | .00 | .00 | 2.00 | | | | | 3.00 | | | | | 4.00 | | | | | 5.00 | | | | | 6.00 | | | | | 7.00 | | | | | 8.00 | | | | | 9.00 | | | | | 10.00 | | | | | 11.00 | | | | | 12.00 | | | | | 13.00 | | | | | 14.00 | | | | | 15.00 | | | | | 16.00 | | | | | 17.00 | | | | | 18.00 | | | | | 18.33 | + 1 | 0 | 2 | 4 | 18.83 | 1 | + 1 | 2 | 4 | 19.10 | +0001 | +0002 | +0002 | +0003 |
| FACE OF FLASH SUPPRESSOR | GAGE MEAS. IN 1/1000 INCH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | LANDS .2190" | | GROOVES .2235" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | VERT | HOR | VERT | HOR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.25 | .000 | .00 | .00 | .00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18.33 | + 1 | 0 | 2 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18.83 | 1 | + 1 | 2 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19.10 | +0001 | +0002 | +0002 | +0003 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

| DATE OF GAUGING 11.22.3" (A) 001239 | | FIRING STATUS (Check One) BEFORE AFTER | | NUMBER OF ROUNDS BEFORE AFTER | | MODEL M16 A1 | | MANUFACTURER G.I. | | CASTING NUMBER | |
|---|--|---|--|----------------------------------|--|------------------------------|--|----------------------|--|----------------|--|
| <p>PROOF OFFICER LINDLEY 331-617-40</p> | | | | | | <p>REAR FACE OF RECEIPT</p> | | | | | |
| <p>FACE OF RECEIPT</p> | | | | | | <p>LANDS 2190" GEOMETRIC</p> | | | | | |
| <p>VERT</p> | | | | | | <p>HOR</p> | | | | | |
| <p>1.25</p> | | | | | | <p>1.00</p> | | | | | |
| <p>2.00</p> | | | | | | <p>8</p> | | | | | |
| <p>3.00</p> | | | | | | <p>7</p> | | | | | |
| <p>4.00</p> | | | | | | <p>6</p> | | | | | |
| <p>5.00</p> | | | | | | <p>6</p> | | | | | |
| <p>6.00</p> | | | | | | <p>6</p> | | | | | |
| <p>7.00</p> | | | | | | <p>6</p> | | | | | |
| <p>8.00</p> | | | | | | <p>5</p> | | | | | |
| <p>9.00</p> | | | | | | <p>4</p> | | | | | |
| <p>10.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>12.30</p> | | | | | | <p>7</p> | | | | | |
| <p>13.30</p> | | | | | | <p>7</p> | | | | | |
| <p>14.30</p> | | | | | | <p>7</p> | | | | | |
| <p>15.30</p> | | | | | | <p>7</p> | | | | | |
| <p>16.30</p> | | | | | | <p>7</p> | | | | | |
| <p>17.30</p> | | | | | | <p>7</p> | | | | | |
| <p>18.30</p> | | | | | | <p>7</p> | | | | | |
| <p>19.30</p> | | | | | | <p>7</p> | | | | | |
| <p>20.30</p> | | | | | | <p>7</p> | | | | | |
| <p>21.30</p> | | | | | | <p>7</p> | | | | | |
| <p>22.30</p> | | | | | | <p>7</p> | | | | | |
| <p>23.30</p> | | | | | | <p>7</p> | | | | | |
| <p>24.30</p> | | | | | | <p>7</p> | | | | | |
| <p>25.30</p> | | | | | | <p>7</p> | | | | | |
| <p>26.30</p> | | | | | | <p>7</p> | | | | | |
| <p>27.30</p> | | | | | | <p>7</p> | | | | | |
| <p>28.30</p> | | | | | | <p>7</p> | | | | | |
| <p>29.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>35.30</p> | | | | | | <p>7</p> | | | | | |
| <p>36.30</p> | | | | | | <p>7</p> | | | | | |
| <p>37.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>39.30</p> | | | | | | <p>7</p> | | | | | |
| <p>40.30</p> | | | | | | <p>7</p> | | | | | |
| <p>41.30</p> | | | | | | <p>7</p> | | | | | |
| <p>42.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>61.30</p> | | | | | | <p>7</p> | | | | | |
| <p>62.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>67.30</p> | | | | | | <p>7</p> | | | | | |
| <p>68.30</p> | | | | | | <p>7</p> | | | | | |
| <p>69.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>73.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>82.30</p> | | | | | | <p>7</p> | | | | | |
| <p>83.30</p> | | | | | | <p>7</p> | | | | | |
| <p>84.30</p> | | | | | | <p>7</p> | | | | | |
| <p>85.30</p> | | | | | | <p>7</p> | | | | | |
| <p>86.30</p> | | | | | | <p>7</p> | | | | | |
| <p>87.30</p> | | | | | | <p>7</p> | | | | | |
| <p>88.30</p> | | | | | | <p>7</p> | | | | | |
| <p>89.30</p> | | | | | | <p>7</p> | | | | | |
| <p>90.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>95.30</p> | | | | | | <p>7</p> | | | | | |
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| <p>97.30</p> | | | | | | <p>7</p> | | | | | |
| <p>98.30</p> | | | | | | <p>7</p> | | | | | |
| <p>99.30</p> | | | | | | <p>7</p> | | | | | |
| <p>100.30</p> | | | | | | <p>7</p> | | | | | |

[illegible]

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| DATE OF GAUGING | | FILING STATUS (Check one) | | NUMBER | MODEL | MANUFACTURER | CASTING NUMBER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 7 AUG 1964 | | BEFORE | AFTER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RIFLE | | | | (5) 007721 | 001 AR15 | 001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PROOF OFFICER | | LINDLEY 331-617-40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISTANCE INCHES | | <table border="1"> <thead> <tr> <th>100</th> <th>200</th> <th>300</th> <th>400</th> <th>500</th> <th>600</th> <th>700</th> <th>800</th> <th>900</th> <th>1000</th> </tr> </thead> <tbody> <tr><td>1.25</td><td>2.00</td><td>3.00</td><td>4.00</td><td>5.00</td><td>6.00</td><td>7.00</td><td>8.00</td><td>9.00</td><td>10.00</td></tr> <tr><td>2.00</td><td>3.00</td><td>4.00</td><td>5.00</td><td>6.00</td><td>7.00</td><td>8.00</td><td>9.00</td><td>10.00</td><td>11.00</td></tr> <tr><td>3.00</td><td>4.00</td><td>5.00</td><td>6.00</td><td>7.00</td><td>8.00</td><td>9.00</td><td>10.00</td><td>11.00</td><td>12.00</td></tr> <tr><td>4.00</td><td>5.00</td><td>6.00</td><td>7.00</td><td>8.00</td><td>9.00</td><td>10.00</td><td>11.00</td><td>12.00</td><td>13.00</td></tr> <tr><td>5.00</td><td>6.00</td><td>7.00</td><td>8.00</td><td>9.00</td><td>10.00</td><td>11.00</td><td>12.00</td><td>13.00</td><td>14.00</td></tr> 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17.00 | 18.00 | 19.00 | 20.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 | 43.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 | 43.00 | 44.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 |
| 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.25 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9.00 | 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10.00 | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 17.00 | 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 18.00 | 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19.00 | 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20.00 | 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 21.00 | 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.00 | 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23.00 | 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 24.00 | 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 25.00 | 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 26.00 | 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27.00 | 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28.00 | 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 29.00 | 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30.00 | 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31.00 | 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32.00 | 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33.00 | 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 34.00 | 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 | 43.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 35.00 | 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 | 43.00 | 44.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 36.00 | 37.00 | 38.00 | 39.00 | 40.00 | 41.00 | 42.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| CAL. 223 - J.F. REL | | CASTING NUMBER | | MANUFACTURER | | MODEL | | NUMBER OF ROUNDS | | FIRING STATUS (Check One) | | DATE OF GAUGING | |
|--|--|----------------|--|--------------|--|---------|--|------------------|--|---------------------------|--|-----------------|--|
| | | | | | | | | | | BEFORE | | AFTER | |
| CAL. 223 - J.F. REL | | 007721 | | BLT AR15 | | 6000 | | | | | | 21 Aug 1964 | |
| RIFLE | | | | | | | | | | | | | |
| PROOF OFFICER LIND-ELF | | | | | | | | | | | | | |
| W.O. 331-617-40 | | | | | | | | | | | | | |
| LANDS 7190 | | GROOVES 2235 | | | | | | | | | | | |
| JER | | HAR | | JER | | HAR | | | | | | | |
| 1.25 | | +0.0004 | | +0.0003 | | +0.0010 | | +0.0011 | | | | | |
| 2.00 | | 4 | | 5 | | 9 | | 10 | | | | | |
| 3.00 | | 4 | | 5 | | 9 | | 10 | | | | | |
| 4.00 | | 3 | | 4 | | 9 | | 10 | | | | | |
| 5.00 | | 4 | | 6 | | 9 | | 10 | | | | | |
| 6.00 | | 4 | | 5 | | 10 | | 10 | | | | | |
| 7.00 | | 4 | | 5 | | 10 | | 12 | | | | | |
| 8.00 | | 5 | | 5 | | 10 | | 14 | | | | | |
| 9.00 | | 5 | | 5 | | 15 | | 17 | | | | | |
| 10.00 | | 6 | | 9 | | 27 | | 27 | | | | | |
| 11.00 | | 7 | | 8 | | 27 | | 23 | | | | | |
| 12.00 | | 9 | | 11 | | 21 | | 21 | | | | | |
| 13.00 | | 10 | | 13 | | 18 | | 18 | | | | | |
| 14.00 | | 12 | | 13 | | 17 | | 18 | | | | | |
| 15.00 | | 13 | | 16 | | 17 | | 19 | | | | | |
| 16.00 | | 15 | | 15 | | 22 | | 19 | | | | | |
| 17.00 | | 12 | | 15 | | 21 | | 19 | | | | | |
| 18.00 | | 11 | | 10 | | 17 | | 18 | | | | | |
| 18.35 | | 7 | | 9 | | 14 | | 15 | | | | | |
| 18.85 | | 17 | | 21 | | 17 | | 17 | | | | | |
| 19.10 | | +0.0028 | | +0.0028 | | +0.0016 | | +0.0015 | | | | | |
| <p>REMARKS -</p> <p>Heavily eroded with numerous light streak cracks, heavy hole, edging and pitting encircling hole from base of bullet seat to approx 400" forward of front heat chisel on lands throughout remainder of hole. Forward edge of gas port heavily eroded. Light deposits of metal throughout hole.</p> | | | | | | | | | | | | | |
| <p>B.I. 0106 Oshorne-Schmitt</p> <p>400</p> | | | | | | | | | | | | | |

| CAL. 223" - COLT AR 15 | | CASTING NUMBER | | MANUFACTURER | | MODEL | | NUMBER OF ROUNDS | | PROOF OFFICER | |
|--------------------------------------|--|---------------------------|--|--------------|--|------------|--|------------------|--|--------------------|--|
| DATE OF GAUGING | | FIRING STATUS (Check One) | | NUMBER | | BEFORE | | AFTER | | LINDLEY 331-617-40 | |
| CAL. 223" | | RIFLE | | (6) 008651 | | COLT AR 15 | | COLT | | LINDLEY 331-617-40 | |
| AUG 1964 | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| BORN SCOPED | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| Twist of rifling 1 turn in 12 inches | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| NO | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| BY | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| E.D.G. | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |

| DATE OF GAUGING | | FIRING STATUS (Check One) | NUMBER | MODEL | MANUFACTURER | CASING NUMBER |
|--|-------|---------------------------|--------|------------|--------------|---------------|
| | | BEFORE | AFTER | | | |
| Cal.. 22.3" | RIFLE | | | (6) 008651 | (Colt) AR15 | (Colt) |
| 11/11/61 | | | | | | |
| <p>PROOF OFFICER KINDLEY 321-67-40</p> <p>NUMBER OF ROUNDS 2000</p> <p>REMARKS: Light gas loading with heavy heat checking. Chambering near head of bullet seat heavily to highly setting and heat checking. Bullet fired from rear end of barrel seat to chamber. Light setting at base. Check in chamber removed & base. This condition was improved all round. Light gases & initial low velocity throughout load. No port lighting loaded.</p> <p>B1 B2</p> | | | | | | |

MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

| CAL. 22.3" - CAL. AR15 | | CASTING NUMBER | | MANUFACTURE | | MODEL | | NUMBER OF ROUNDS | | FIRING STATUS (Check one) | | DATE OF GAUGING | |
|--|--|---|--|---|--|-------------|--|------------------|--|---|--|-----------------|--|
| | | | | | | | | | | BEFORE | | AFTER | |
| CAL. 22.3" - CAL. AR15 | | Cal. 1 | | PROOF OFFICER LINGLEY- 231-6177-110 | | Cal. 1 AR15 | | 4000 | | <input checked="" type="checkbox"/> AFTER | | 18 AUG 1964 | |
| <p>MEASUREMENTS FROM</p> <p>LEADS 2.190" GROOVES 2.235"</p> <p>VERT. HOR. VERT. HOR.</p> | | <p>1.25 F.0000 +.0003 +.0010 F.0009</p> <p>3 3 4 9</p> <p>3 3 4 9</p> <p>4 4 4 9</p> <p>4 4 4 10</p> <p>4 4 5 9</p> <p>4 4 5 10</p> <p>3 4 10 13</p> <p>3 3 12 10</p> <p>5 4 13 11</p> <p>3 5 13 12</p> <p>3 3 15 14</p> <p>4 4 14 14</p> <p>14.00 2 0 14 14</p> <p>15.00 7 + 6 13 13</p> <p>16.00 5 7 13 13</p> <p>17.00 5 7 12 12</p> <p>18.00 5 6 11 11</p> <p>18.35 7 7 11 10</p> <p>18.85 11 15 12 12</p> <p>19.10 +.0027 +.0027 +.0010 +.0011</p> | | <p>PREFUSED -</p> <p>HEAVY LIGHT STRESS GAUGES WENT CHECKING W/ NUMEROUS</p> <p>LIGHT STRESS GAUGES ENCIRCLING REAR EDGE</p> <p>OF BULLET SHOT - HEAVY TO LIGHT HEAT CHECKING</p> <p>+ HITTING ENCIRCLING REAR FROM REAR OF</p> <p>BULLET SHOT (1000X) 11.00" FORWARD -</p> <p>NUMEROUS LIGHT STRESS GAUGES INTERMITTENTLY</p> <p>THRU OUT THE REAR - LIGHT HEAT CHECKING</p> <p>+ HITTING THRU OUT REMAINDER OF BULLET -</p> <p>HEAVY TO LIGHT HEAT CHECKING THRU OUT REAR -</p> <p>ENCIRCLING REAR OF BULLET 11.00" FORWARD -</p> <p>ENCIRCLING REAR OF BULLET 11.00" FORWARD -</p> | | | | | | | | | |
| BY | | OSBORNE | | SCHANTE | | | | | | | | | |
| BLDG | | 400 | | | | | | | | | | | |

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MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

| 5.56 7m | | 008625 | | 601715 | | Colt | | 5.56 7m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|----------|---|----------|----------------------------|--|---|--|---|--|----------|----------|----------|----------|----------|------|--------|--------|--------|--------|------|---|---|----|----|------|---|---|----|----|------|---|---|----|----|------|---|---|----|----|------|---|---|----|----|------|---|---|----|----|------|---|---|----|----|------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|-------|---|---|----|----|
| DATE OF GAUGING 21-JULY-64 | | FIRING STATUS (Check One) BEFORE AFTER | | NUMBER OF ROUNDS 601715 | | PROOF OFFICER LIMOLEY V.L.O. 231-617-40 | | CASTING NUMBER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | <table border="1"> <thead> <tr> <th>STARGAGE</th> <th>STARGAGE</th> <th>STARGAGE</th> <th>STARGAGE</th> <th>STARGAGE</th> </tr> </thead> <tbody> <tr><td>1.25</td><td>1.0003</td><td>1.0004</td><td>1.0006</td><td>1.0007</td></tr> <tr><td>2.00</td><td>6</td><td>6</td><td>06</td><td>06</td></tr> <tr><td>3.00</td><td>6</td><td>6</td><td>07</td><td>07</td></tr> <tr><td>4.00</td><td>6</td><td>6</td><td>07</td><td>07</td></tr> <tr><td>5.00</td><td>6</td><td>6</td><td>07</td><td>07</td></tr> <tr><td>6.00</td><td>6</td><td>7</td><td>07</td><td>07</td></tr> <tr><td>7.00</td><td>6</td><td>6</td><td>07</td><td>07</td></tr> <tr><td>8.00</td><td>6</td><td>6</td><td>07</td><td>07</td></tr> <tr><td>9.00</td><td>6</td><td>6</td><td>06</td><td>06</td></tr> <tr><td>10.00</td><td>6</td><td>3</td><td>06</td><td>06</td></tr> <tr><td>11.00</td><td>6</td><td>6</td><td>06</td><td>06</td></tr> <tr><td>12.00</td><td>6</td><td>6</td><td>06</td><td>07</td></tr> 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| 06 | 06 | 29.00 | 6 | 3 | 06 | 06 | 30.00 | 6 | 3 | 06 | 06 | 31.00 | 6 | 3 | 06 | 06 | 32.00 | 6 | 3 | 06 | 06 | 33.00 | 6 | 3 | 06 | 06 | 34.00 | 6 | 3 | 06 | 06 | 35.00 | 6 | 3 | 06 | 06 | 36.00 | 6 | 3 | 06 | 06 | 37.00 | 6 | 3 | 06 | 06 | 38.00 | 6 | 3 | 06 | 06 | 39.00 | 6 | 3 | 06 | 06 | 40.00 | 6 | 3 | 06 | 06 | 41.00 | 6 | 3 | 06 | 06 | 42.00 | 6 | 3 | 06 | 06 | 43.00 | 6 | 3 | 06 | 06 | 44.00 | 6 | 3 | 06 | 06 | 45.00 | 6 | 3 | 06 | 06 | 46.00 | 6 | 3 | 06 | 06 | 47.00 | 6 | 3 | 06 | 06 | 48.00 | 6 | 3 | 06 | 06 | 49.00 | 6 | 3 | 06 | 06 | 50.00 | 6 | 3 | 06 | 06 | 51.00 | 6 | 3 | 06 | 06 | 52.00 | 6 | 3 | 06 | 06 | 53.00 | 6 | 3 | 06 | 06 | 54.00 | 6 | 3 | 06 | 06 | 55.00 | 6 | 3 | 06 | 06 | 56.00 | 6 | 3 | 06 | 06 | 57.00 | 6 | 3 | 06 | 06 | 58.00 | 6 | 3 | 06 | 06 | 59.00 | 6 | 3 | 06 | 06 | 60.00 | 6 | 3 | 06 | 06 |
| STARGAGE | STARGAGE | STARGAGE | STARGAGE | STARGAGE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.25 | 1.0003 | 1.0004 | 1.0006 | 1.0007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 3.00 | 6 | 6 | 07 | 07 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 9.00 | 6 | 6 | 06 | 06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 56.00 | 6 | 3 | 06 | 06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 57.00 | 6 | 3 | 06 | 06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 58.00 | 6 | 3 | 06 | 06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 59.00 | 6 | 3 | 06 | 06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60.00 | 6 | 3 | 06 | 06 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | <p>Twist of Bullets - Turn in 12"</p> <p>Reinspected -</p> <p>LIGHT EROSION ENCIRCLING FORWARD PORTION OF STRAIGHT OF CHAMFER - LIGHT SURFACE EROSION TOOL MARKS AND LIGHT ABRASIVE MARKS ENCIRCLING FORWARD PORTION OF CHAMFER TOOL MARKS, LIGHT PITTING AND LIGHT METAL DEPOSITS ON BULLETS - CORROSIVE THRU OUT BULLETS MODERATE EROSION ON FORWARD EDGE OF GAS MAT</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[illegible]

| 5.56 (BARREL) - XM16E1 | | FIRE STATUS (Check One) | | MODEL | | NUMBER OF BOUNDS | | MODEL | | CASSING NUMBER | |
|--|-----------------|-------------------------|--------|--------|--------|------------------|--------|--------|--------|----------------|--------|
| DATE OF GAUGING | | FIRING STATUS | | MODEL | | NUMBER OF BOUNDS | | MODEL | | CASSING NUMBER | |
| BEFORE | | AFTER | | MODEL | | NUMBER OF BOUNDS | | MODEL | | CASSING NUMBER | |
| 5.56 7" | BARREL | 023295 | XM16E1 | 023295 | XM16E1 | 023295 | XM16E1 | 023295 | XM16E1 | 023295 | XM16E1 |
| 21-July-64 | DATE OF GAUGING | 023295 | XM16E1 | 023295 | XM16E1 | 023295 | XM16E1 | 023295 | XM16E1 | 023295 | XM16E1 |
| <p>5.56 (BARREL) - XM16E1</p> <p>1.25 + .0006 + .0005 + .0005 + .0008</p> <p>2.00 02 04 06 06</p> <p>3.00 03 04 06 06</p> <p>4.00 03 04 05 06</p> <p>5.00 03 04 05 06</p> <p>6.00 03 03 05 06</p> <p>7.00 03 03 05 05</p> <p>8.00 03 03 04 04</p> <p>9.00 03 03 04 05</p> <p>10.00 03 03 04 05</p> <p>11.00 03 03 03 05</p> <p>12.00 03 03 03 05</p> <p>13.00 03 03 03 05</p> <p>14.00 03 03 04 05</p> <p>15.00 03 03 04 05</p> <p>16.00 03 03 04 05</p> <p>17.00 03 03 04 05</p> <p>18.00 03 03 03 05</p> <p>19.00 03 03 03 05</p> <p>19.10 + .0003 + .0003 + .0003 + .0003</p> <p>1.25 + .0006 + .0005 + .0005 + .0008</p> <p>2.00 02 04 06 06</p> <p>3.00 03 04 06 06</p> <p>4.00 03 04 05 06</p> <p>5.00 03 04 05 06</p> <p>6.00 03 03 05 06</p> <p>7.00 03 03 05 05</p> <p>8.00 03 03 04 04</p> <p>9.00 03 03 04 05</p> <p>10.00 03 03 04 05</p> <p>11.00 03 03 03 05</p> <p>12.00 03 03 03 05</p> <p>13.00 03 03 03 05</p> <p>14.00 03 03 04 05</p> <p>15.00 03 03 04 05</p> <p>16.00 03 03 04 05</p> <p>17.00 03 03 04 05</p> <p>18.00 03 03 03 05</p> <p>19.00 03 03 03 05</p> <p>19.10 + .0003 + .0003 + .0003 + .0003</p> <p>1.25 + .0006 + .0005 + .0005 + .0008</p> <p>2.00 02 04 06 06</p> <p>3.00 03 04 06 06</p> <p>4.00 03 04 05 06</p> <p>5.00 03 04 05 06</p> <p>6.00 03 03 05 06</p> <p>7.00 03 03 05 05</p> <p>8.00 03 03 04 04</p> <p>9.00 03 03 04 05</p> <p>10.00 03 03 04 05</p> <p>11.00 03 03 03 05</p> <p>12.00 03 03 03 05</p> <p>13.00 03 03 03 05</p> <p>14.00 03 03 04 05</p> <p>15.00 03 03 04 05</p> <p>16.00 03 03 04 05</p> <p>17.00 03 03 04 05</p> <p>18.00 03 03 03 05</p> <p>19.00 03 03 03 05</p> <p>19.10 + .0003 + .0003 + .0003 + .0003</p> | | | | | | | | | | | |

| 5.56 77 BARREL XM 16E1 | | Casting Number | | Manufacturer | | Model | | Number of Rounds | | Firing Status (Check One) | | Date of Gauging | |
|--|--|--------------------------|--|--------------|--|----------------|--|------------------|--|--|--|-----------------|--|
| | | | | | | | | | | <input checked="" type="checkbox"/> BEFORE <input type="checkbox"/> AFTER | | | |
| 5.56 77 | | 023348 | | X 1716E1 | | B.F. AT AP6 | | BORKHOPE | | | | 21-JUL-64 | |
| PROOF OFFICER LINDSEY | | W.O. 331-617-40 | | | | | | | | | | | |
| DISTANCE (INCHES) | | FACE OF FLASH SUPPRESSOR | | LANDS 2.190" | | GROOVES 2.235" | | | | | | | |
| | | | | VERT | | HOR | | VERT | | HOR | | | |
| 1.25 | | +0.0010 | | +0.0009 | | +0.0010 | | +0.0010 | | | | | |
| 2.00 | | 07 | | 07 | | 09 | | 09 | | | | | |
| 3.00 | | 08 | | 08 | | 09 | | 09 | | | | | |
| 4.00 | | 08 | | 08 | | 09 | | 09 | | | | | |
| 5.00 | | 09 | | 09 | | 09 | | 09 | | | | | |
| 6.00 | | 08 | | 07 | | 09 | | 09 | | | | | |
| 7.00 | | 07 | | 07 | | 08 | | 09 | | | | | |
| 8.00 | | 07 | | 07 | | 08 | | 09 | | | | | |
| 9.00 | | 09 | | 08 | | 09 | | 09 | | | | | |
| 10.00 | | 09 | | 09 | | 09 | | 09 | | | | | |
| 11.00 | | 07 | | 07 | | 08 | | 08 | | | | | |
| 12.00 | | 07 | | 08 | | 07 | | 07 | | | | | |
| 13.00 | | 07 | | 07 | | 07 | | 07 | | | | | |
| 14.00 | | 08 | | 08 | | 08 | | 08 | | | | | |
| 15.00 | | 07 | | 08 | | 08 | | 08 | | | | | |
| 16.00 | | 07 | | 07 | | 07 | | 07 | | | | | |
| 17.00 | | 07 | | 06 | | 06 | | 06 | | | | | |
| 18.00 | | 07 | | 06 | | 05 | | 05 | | | | | |
| 18.35 | | 07 | | 06 | | 05 | | 05 | | | | | |
| 19.10 | | +0.0006 | | +0.0006 | | +0.0005 | | +0.0006 | | | | | |
| TWIST OF RIFLING - 1 TURN IN 12" | | | | | | | | | | | | | |
| BORKHOPE | | | | | | | | | | | | | |
| LIGHT CIRCUMFERENTIAL TOOL MARKS ENCIRCLING CARRIER - | | | | | | | | | | | | | |
| LIGHT HEAVY CIRCUMFERENTIAL ENCIRCLING FORWARD PORTION | | | | | | | | | | | | | |
| OF IN STRAIGHT OF CARRIER - LIGHT CIRCUMFERENTIAL | | | | | | | | | | | | | |
| GONGE ENCIRCLING FORGING CONE AREA - LIGHT ABRASIVE | | | | | | | | | | | | | |
| WEAR ON FORGING CONE - LIGHT PROJECTION ON CONE | | | | | | | | | | | | | |
| EDGE OF CONE WENT - LIGHT MILIUM DEPOSITS THROUGH | | | | | | | | | | | | | |
| WORE - | | | | | | | | | | | | | |
| S. H. H. - K. H. H. | | | | | | | | | | | | | |

MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

7.62 mm.

Q. 1. 17-12. 1714-1714

| DATE OF GAUGING | NUMBER | MODEL | MANUFACTURER | CASTING NUMBER | FIRING STATUS (Check One) | | NUMBER OF ROUNDS | PROOF OFFICER | STARGAGE MEASUREMENTS | | | | |
|---|---------|-------|--------------|----------------|---------------------------|-------|------------------|------------------|-----------------------|--------|--------|--------|--------|
| | | | | | BEFORE | AFTER | | | 1 | 2 | 3 | 4 | |
| 7.6277 | 1563467 | 1714 | H & R | | | | | W.O. 331-117-117 | 3.20 | ±0.016 | ±0.016 | ±0.016 | ±0.017 |
| 1.1.30 | | | | | | | | | 3.32 | 16 | 16 | 16 | 16 |
| | | | | | | | | | 11.00 | 16 | 16 | 16 | 16 |
| | | | | | | | | | 11.00 | 16 | 16 | 16 | 16 |
| | | | | | | | | | 6.00 | 17 | 16 | 17 | 17 |
| | | | | | | | | | 4.00 | 17 | 16 | 17 | 17 |
| | | | | | | | | | 4.00 | 17 | 16 | 17 | 17 |
| | | | | | | | | | 9.00 | 18 | 16 | 17 | 17 |
| | | | | | | | | | 10.00 | 16 | 16 | 17 | 17 |
| | | | | | | | | | 11.00 | 16 | 17 | 18 | 18 |
| | | | | | | | | | 12.00 | 16 | 16 | 17 | 17 |
| | | | | | | | | | 13.00 | 16 | 16 | 17 | 17 |
| | | | | | | | | | 14.00 | 16 | 16 | 16 | 16 |
| | | | | | | | | | 15.00 | 16 | 16 | 16 | 17 |
| | | | | | | | | | 16.00 | 15 | 16 | 16 | 17 |
| | | | | | | | | | 17.00 | 15 | 16 | 17 | 16 |
| | | | | | | | | | 18.00 | 15 | 15 | 16 | 16 |
| | | | | | | | | | 19.00 | 15 | 14 | 16 | 17 |
| | | | | | | | | | 20.00 | 14 | 13 | 14 | 17 |
| | | | | | | | | | 21.00 | 13 | 13 | 15 | 16 |
| | | | | | | | | | 21.17 | 12 | 14 | 15 | 16 |
| | | | | | | | | | 22.17 | 12 | 13 | 16 | 16 |
| | | | | | | | | | 22.27 | 12 | 13 | 16 | 16 |
| | | | | | | | | | 22.47 | ±0.013 | ±0.013 | ±0.016 | 14 |
| TRUST AT RIFLING 1 TURN IN 12" | | | | | | | | | | | | | |
| BORE SCOPED - | | | | | | | | | | | | | |
| LIGHT CIRCUITS - 100% TEST OUT - ENGINE LINE | | | | | | | | | | | | | |
| CHAMBER AND EXT. RING - 100% TEST OUT - ENGINE LINE | | | | | | | | | | | | | |
| HEADS - 100% TEST OUT - ENGINE LINE | | | | | | | | | | | | | |
| LIGHT METAL - 100% TEST OUT - ENGINE LINE | | | | | | | | | | | | | |
| LIGHT EROSION ON - 100% TEST OUT - ENGINE LINE | | | | | | | | | | | | | |

[illegible]

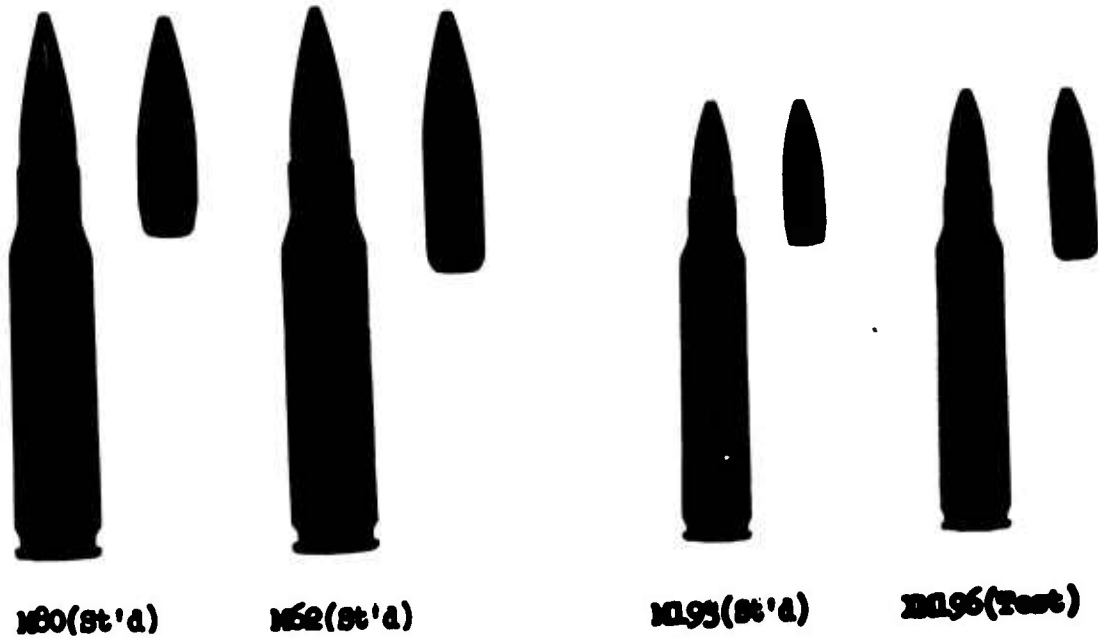
MULTIPLE STARGAGE MEASUREMENT & INSPECTION DATA FORM

| DATE OF GAUGING | | FIRING STATUS (Check One) | | NUMBER OF ROUNDS | | MODEL | | MANUFACTURER | | CASTING NUMBER | |
|--------------------|--|--|-------|------------------|--|-------|--|--|--|----------------|--|
| | | BEFORE | AFTER | | | | | | | | |
| 7.62.77 CAL. 30 | | | | B.F. AT R.P.G. | | M14 | | H&R | | X | |
| 21-JUL-64 | | | | | | | | PROOF OFFICER LINDLEY W.C. 331-617-40 | | | |
| | | <div> <div> DIST. (INCHES) FROM Muzzle FACE OF BARREL </div> <div> DIST. IN GROOVES LANDS .2995" GROOVES .3075" </div> </div> | | | | | | | | | |
| | | <div> <div>VERT</div> <div>HOR</div> <div>VERT</div> <div>HOR</div> </div> | | | | | | | | | |
| | | <div> <div>3.20</div> <div>+ .0007</div> <div>+ .0008</div> <div>+ .0010</div> <div>+ .0011</div> </div> | | | | | | | | | |
| | | <div> <div>3.20</div> <div>08</div> <div>09</div> <div>11</div> <div>11</div> </div> | | | | | | | | | |
| | | <div> <div>4.00</div> <div>09</div> <div>09</div> <div>11</div> <div>12</div> </div> | | | | | | | | | |
| | | <div> <div>5.00</div> <div>10</div> <div>04</div> <div>11</div> <div>13</div> </div> | | | | | | | | | |
| | | <div> <div>6.00</div> <div>12</div> <div>10</div> <div>12</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>7.00</div> <div>12</div> <div>11</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>8.00</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>9.00</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>10.00</div> <div>13</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>11.00</div> <div>14</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>12.00</div> <div>13</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>13.00</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>14.00</div> <div>12</div> <div>12</div> <div>14</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>15.00</div> <div>13</div> <div>12</div> <div>14</div> <div>13</div> </div> | | | | | | | | | |
| | | <div> <div>16.00</div> <div>13</div> <div>10</div> <div>14</div> <div>13</div> </div> | | | | | | | | | |
| | | <div> <div>17.00</div> <div>13</div> <div>11</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>18.00</div> <div>13</div> <div>12</div> <div>12</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>19.00</div> <div>12</div> <div>12</div> <div>12</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>20.00</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>21.00</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>21.17</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>22.17</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>22.27</div> <div>12</div> <div>12</div> <div>13</div> <div>14</div> </div> | | | | | | | | | |
| | | <div> <div>23.47</div> <div>+ .0012</div> <div>+ .0012</div> <div>+ .0013</div> <div>+ .0014</div> </div> | | | | | | | | | |
| | | <div> <div>TWIST OF RIFLING = 1 TURN IN 17"</div> <div>ROCKING =</div> </div> | | | | | | | | | |
| | | <div> <div>LIGHT CIRCUMFERENTIAL TOOL MARKS ENCIRCLING</div> <div>CHAMBER & EXTENDING ON TO COMMENCEMENT OF</div> <div>RIFLING - NO DISCERNIBLE FLATTENED OR FISSURE</div> <div>CONIF - LIGHT PITCH DEPOSITS THROUGHOUT BORE -</div> <div>LIGHT EMISSION FROM MOUTH OF BARREL -</div> </div> | | | | | | | | | |
| | | <div> <div>SCHMIDT-KENIC</div> </div> | | | | | | | | | |

APPENDIX II - FINDINGS

| <u>TEST PLAN REQUIREMENT</u> | <u>PERFORMANCE</u> |
|---|--|
| 1. Determine the physical characteristics of the test item. | Satisfactory (ref par. 2.1 and Reference 3). |
| 2. Determine the accuracy of the test cartridge. | Satisfactory (ref par. 2.2 and Reference 3). |
| 3. Determine the trace characteristics of the test cartridge. | Satisfactory (ref par. 2.3 and Reference 3). |
| 4. Determine the maximum number of test cartridges that can be safely fired from the M16 rifle without the occurrence of a premature functioning caused by chamber heating. | Satisfactory (ref par. 2.4 and Appendix I). |
| 5. Determine the ability of the test cartridge to withstand vibrations caused by firing the M16 rifle. | Satisfactory (ref par. 2.5). |
| 6. Determine the deflection characteristics of the test cartridge. | (Ref par. 2.6.4.) |
| 7. Determine the erosion characteristics of the test cartridge. | Satisfactory (ref par. 2.7 and Appendix I). |
| 8. Determine the penetration characteristics of the test cartridge. | Satisfactory (ref par. 2.8). |
| 9. Determine if the test cartridge generates sufficient operating energy to insure reliable automatic functioning of the XM16E1 rifle when fired with the weapon held in various positions. | Satisfactory (ref par. 2.9). |

APPENDIX III - PHOTOGRAPH



CARTRIDGE, 5.56-MM, TRACER: M196


| | | DATA | |
|----------------------------|---------------------|---|-------------------------------|
| Standard: | Cartridge, 7.62-mm: | M80, Ball, M80 (Ord. Eng. No. C-8999543) | |
| | Cartridge, 7.62-mm: | M82, Tracer, M82 (Ord. Eng. No. C-755705) | |
| | Cartridge, 5.56-mm: | Ball, M193 (MUCM Eng. No. D-10523632) | |
| Test : | Cartridge, 5.56-mm: | Tracer, M196 (MUCM Eng. No. C-10534193) | |
| | | Standard | Test |
| Bullet | | M80, Wt. 151-3 gr | M196, Wt. 95 gr |
| | | M82, Wt. 141-4 gr | |
| | | M193, Wt. 55 gr | |
| Case | 7.62-mm: | Brass, FA T1-E3 | 5.56-mm: Brass |
| | 5.56-mm: | Brass | |
| Propellant | 7.62-mm: | WC 846.4, 47.1 gr | 5.56-mm: IMR-4473, 25 gr |
| | 5.56-mm: | IMR-4473, 25 gr | |
| Primer | 7.62-mm: | FA-96 | 5.56-mm: Remington 98M |
| | 5.56-mm: | Remington 98M | |
| Instrumental Velocity, fps | 7.62-mm: | 2790 \pm 30 at 78' | 5.56-mm: 3800 \pm 40 at 15' |
| | 5.56-mm: | 3850 \pm 40 at 15' | |
| Chamber Pressure, psi | 7.62-mm: | 90,000 Max. | 5.56-mm: 92,000 Max. |
| | 5.56-mm: | 92,000 Max. | |

View showing the M80, M82 and M193 cartridges with sectionalized bullets (standard) on the left and the M196 cartridge with sectionalized bullet (test) on the right.

APPENDIX IV - DRAWINGS

NOTE: - This document contains specifications and drawings which are used for procurement purposes only. It is not intended to be used as a basis for design or construction of other than the item specified. The user of this document may have access to information which is classified "SECRET" or "CONFIDENTIAL". It is the responsibility of the user to ensure that this information is controlled in accordance with the applicable security requirements.

| PHYSICAL PROPERTIES | DO NOT USE | APPLY PART NO. | REVISIONS | | | |
|---------------------|------------|----------------|-----------|-------------|---------|----------|
| | | | REV | DESCRIPTION | DATE | INITIALS |
| VP | | | A | EOR S3C025 | 6-26-63 | J.C. |
| TS | | | | | | |
| ELI | | | | | | |
| RA | | | | | | |
| CH | | | | | | |
| RH | | | | | | |



PROPELLANT

SPEC MIL-P-3984
TYPE I, CLASS 2, TUBULAR

| COLUMN 1 | COLUMN 2 | COLUMN 3 |
|-------------|-----------------|------------------|
| PART NUMBER | ITEM | LOAD |
| 10523620 | DUPONT IMR 4475 | 25 GRAINS APPROX |

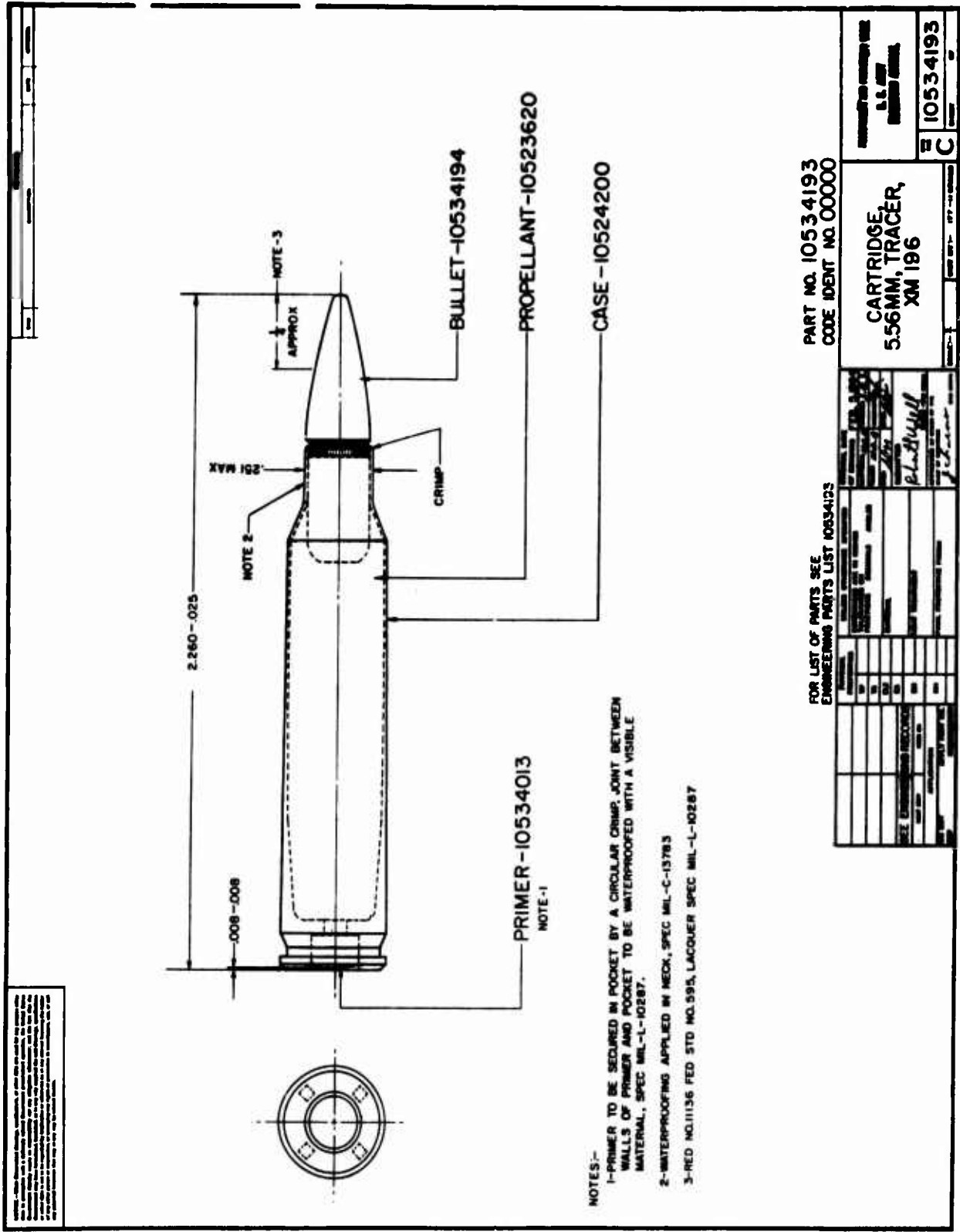
NOTES:-

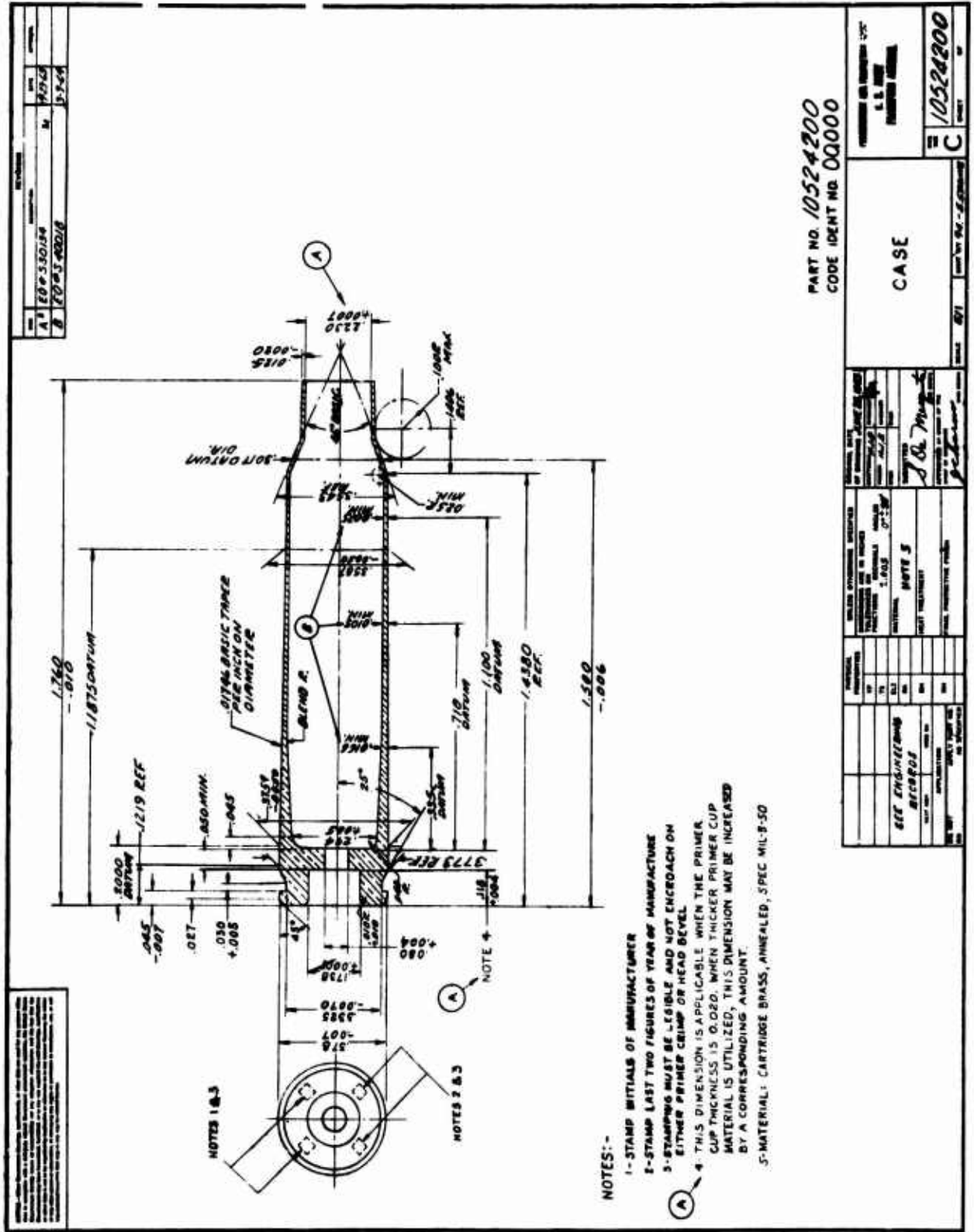
- 1-ACTUAL LOAD WEIGHT TO MEET BALLISTIC REQUIREMENTS.
- 2-COMMERCIAL ITEM LISTED MEETS THE REQUIREMENTS SPECIFIED BY MIL-P-3984
- 3-ALL OTHER SOURCES MUST COMPLY WITH DRAWING REQUIREMENTS AND IN ADDITION THE ITEM MUST BE FUNCTIONALLY EQUIVALENT TO THE MANUFACTURER'S ITEM INDICATED. MUNITIONS COMMAND APPROVAL REQUIRED.

FOR LIST OF PARTS SEE
ENGINEERING PARTS LIST 10523620

PART NO. 10523620
CODE IDENT NO. 00000

| | | |
|--|---|--|
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN DECIMAL INCHES OR FRACTIONS DECIMALS ANGLE MATERIAL HEAT TREATMENT FINAL PROTECTIVE FINISH | ORIGINAL DATE OF DRAWING JAN 25, 1963 REVISIONS REASON FOR CHANGE AUTHORITY APPROVED BY ORDER OF THE CHIEF OF COMMAND [Signature] [Stamp] | <h1 style="margin: 0;">PROPELLANT</h1> |
| | | PROCUREMENT AND PRODUCTION GROUP U.S. ARMY MUNITIONS COMMAND WRIGHT PATERSON AIRFIELD |
| | | 10523620 |





| REVISIONS | | DATE | APPROVAL |
|---|-------------|------|----------|
| BY | DESCRIPTION | | |
| <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: left;"> <p>NOTES:-</p> <p>1-ALL DIMENSIONS APPROX</p> <p>2-POINT FILLER TO BE CONTROLLED BY WEIGHT</p> <p>3-MATERIAL:-LEAD ANTIMONY, SPEC MIL-L-13283, GRADE NO1</p> </div> </div> | | | |

PART NO. 10534196

CODE IDENT NO. 00000

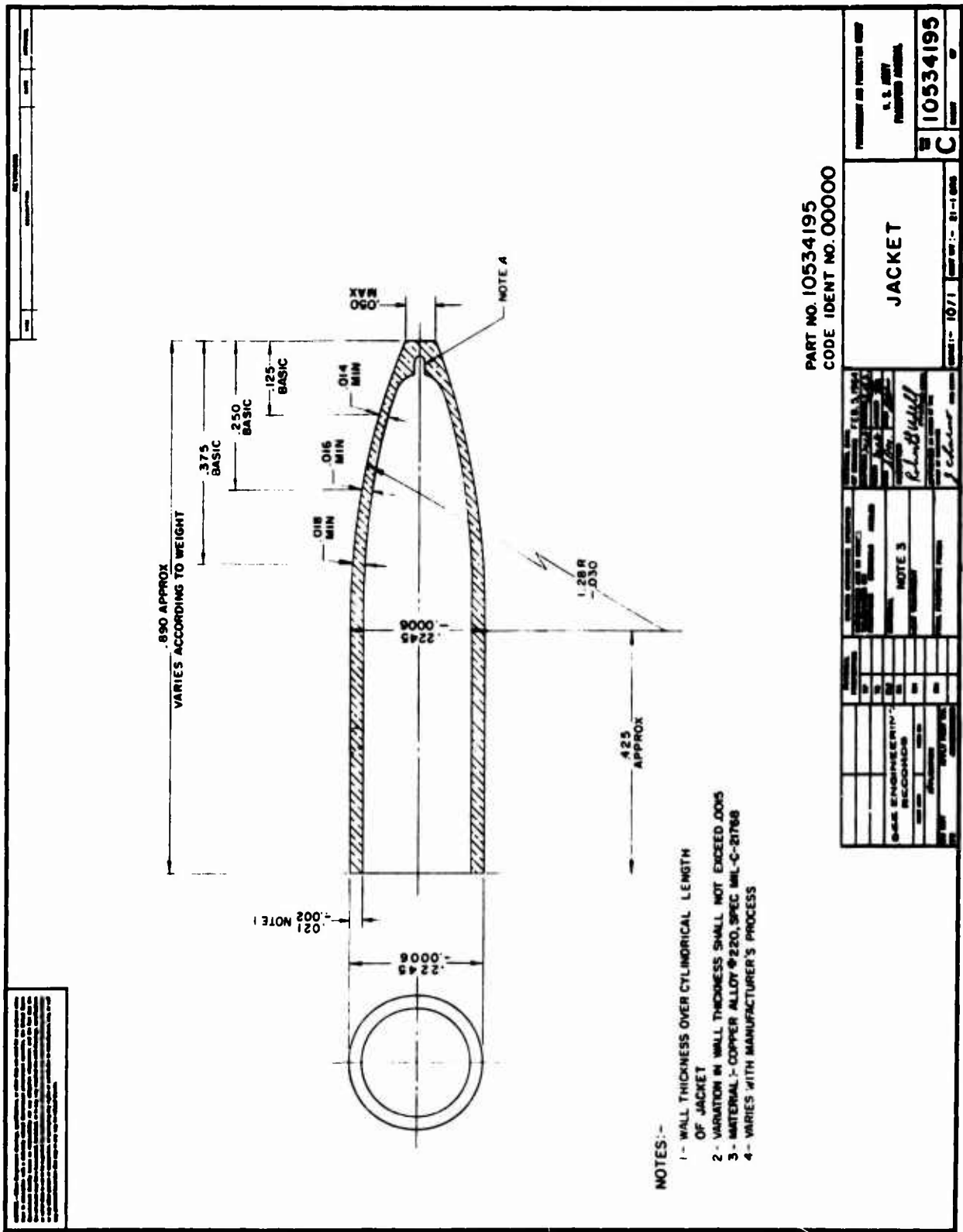
| | | |
|--|--|--|
| FILLER, POINT | | <p>10534196</p> <p>B</p> |
| <p>SCALE:- 1" = 1.00"</p> <p>UNIT WT:- 20-25 GRAMS</p> | | <p>APPROVED BY: 1.1.1.1</p> <p>DATE: 1.1.1.1</p> |

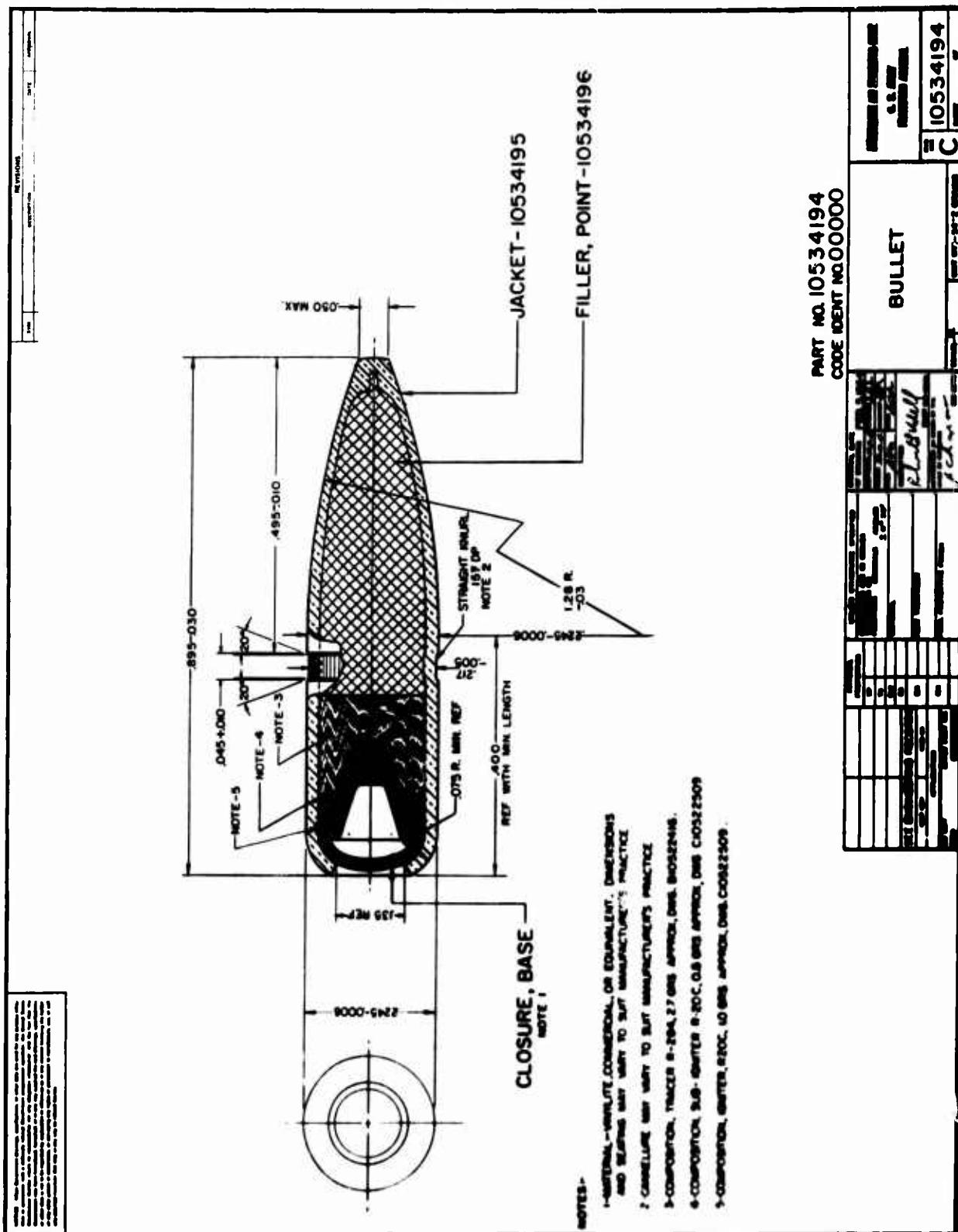
| | |
|---|--|
| <p>ORIGINAL DATE: FEB 3, 1954</p> <p>DESIGNED BY: 1.1.1.1</p> <p>CHECKED BY: 1.1.1.1</p> <p>DATE: 1.1.1.1</p> | |
| <p>UNLESS OTHERWISE SPECIFIED</p> <p>DIMENSIONS ARE IN INCHES</p> <p>TOLERANCES ARE IN ANGLES</p> <p>FRACTIONS DECIMALS</p> | |
| <p>MATERIAL: NOTE 3</p> <p>HEAT TREATMENT:</p> <p>FINAL PROTECTIVE FINISH:</p> | |

| | |
|---|--|
| <p>PHYSICAL PROPERTIES</p> <p>TP</p> <p>TS</p> <p>EL. 2</p> <p>RA</p> <p>BM</p> <p>PH</p> | |
| <p>SEE ENGINEERING RECORDS</p> <p>APPLY FOR INFO</p> | |

| REVISIONS | | DATE | APPROVAL |
|---|-------------|------|----------|
| REV | DESCRIPTION | | |
| <p>(a)-LEAD STYPHNATE TYPE PRIMING COMPOSITIONS SHALL BE USED INGREDIENTS OF COMPOSITION SHALL BE LIMITED TO ANY COMBINATION OF ANY OR ALL OF THE FOLLOWING: LEAD STYPHNATE, NORMAL, FA-PD-MI-2458 OR LEAD STYPHNATE, BASIC, FA-PD-MI-2473; TETRACENE, MIL-T-46938(MU), BARIUM NITRATE, MIL-B-162, LEAD DIOXIDE, FA-PD-MI-2381 ZIRCONIUM, FA-PD-MI-2364, ANTIMONY SULFIDE, MIL-A-159, LIGHT GUM SOLUTION, DWG B10522390; CALCIUM SILICIDE, MIL-C-324, ALUMINUM, MIL-A-512, PENTAERYTHRITE TETRANITRATE (PETN), MIL-P-387, LEAD THIOCYANATE (SULPHOCYANATE), JAN-L-65, NITROCELLULOSE (GRADE B), JAN-N-244</p> <p>(b)-METALLIC COMPONENTS (CUP AND ANVIL) SHALL BE OF BRASS, SPECIFICATION MIL-B-50</p> <p>(c)-PRIMER CUP AND ANVIL CONFIGURATION. USE OF FCIL, SHELLAC, SPEC. JAN-S-732 AND LACQUER, SPEC MIL-L-10287 ARE OPTIONAL COMMENSURATE WITH THEIR COMPATIBILITY WITH OTHER COMPONENT AND CARTRIDGE REQUIREMENTS.</p> | | | |

| | | | | | |
|--|--|--|--|---|--|
| PART NO. 10534013 CODE IDENT NO. 00000 | | PRIMER, 5.56 MM | | PREPARED AND PRODUCTION SHOP U. S. ARMY FRANKFORD - RECAL | |
| ORIGINAL DATE OF DRAWING NOV 4 1963 REVISIONS 1. 10/1/63 2. 10/1/63 3. 10/1/63 4. 10/1/63 5. 10/1/63 6. 10/1/63 7. 10/1/63 8. 10/1/63 9. 10/1/63 10. 10/1/63 11. 10/1/63 12. 10/1/63 13. 10/1/63 14. 10/1/63 15. 10/1/63 16. 10/1/63 17. 10/1/63 18. 10/1/63 19. 10/1/63 20. 10/1/63 21. 10/1/63 22. 10/1/63 23. 10/1/63 24. 10/1/63 25. 10/1/63 26. 10/1/63 27. 10/1/63 28. 10/1/63 29. 10/1/63 30. 10/1/63 31. 10/1/63 32. 10/1/63 33. 10/1/63 34. 10/1/63 35. 10/1/63 36. 10/1/63 37. 10/1/63 38. 10/1/63 39. 10/1/63 40. 10/1/63 41. 10/1/63 42. 10/1/63 43. 10/1/63 44. 10/1/63 45. 10/1/63 46. 10/1/63 47. 10/1/63 48. 10/1/63 49. 10/1/63 50. 10/1/63 51. 10/1/63 52. 10/1/63 53. 10/1/63 54. 10/1/63 55. 10/1/63 56. 10/1/63 57. 10/1/63 58. 10/1/63 59. 10/1/63 60. 10/1/63 61. 10/1/63 62. 10/1/63 63. 10/1/63 64. 10/1/63 65. 10/1/63 66. 10/1/63 67. 10/1/63 68. 10/1/63 69. 10/1/63 70. 10/1/63 71. 10/1/63 72. 10/1/63 73. 10/1/63 74. 10/1/63 75. 10/1/63 76. 10/1/63 77. 10/1/63 78. 10/1/63 79. 10/1/63 80. 10/1/63 81. 10/1/63 82. 10/1/63 83. 10/1/63 84. 10/1/63 85. 10/1/63 86. 10/1/63 87. 10/1/63 88. 10/1/63 89. 10/1/63 90. 10/1/63 91. 10/1/63 92. 10/1/63 93. 10/1/63 94. 10/1/63 95. 10/1/63 96. 10/1/63 97. 10/1/63 98. 10/1/63 99. 10/1/63 100. 10/1/63 | | UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON ANGLES FRACTIONS DECIMALS ANGLES MATERIAL HEAT TREATMENT FINAL PROTECTIVE FINISH | | SCALE UNIT WT | |
| SEE ENGINEERING RECORDS NEXT ARMY APPLICATION APPLY PART NO AS SPECIFIED | | APPROVED BY (NAME OF DESIGNER) 10/1/63 | | 10534013 B SHEET OF | |





APPENDIX V - CORRESPONDENCE

**U. S. ARMY
DEVELOPMENT AND PROOF SERVICES
ABERDEEN PROVING GROUND, MARYLAND 21005**

STEAP-DS-TI

26 OCT 1964

**SUBJECT: First Letter Report on Engineering Test of Cartridge,
5.56-mm, Tracer, XM196, USATECOM Project No. 8-4-0210-02-C**

DPS-1499 (L)

**TO: Commanding General
U.S. Army Test and Evaluation Command
ATTN: AMSTL-BC
Aberdeen Proving Ground, Maryland 21005**

1. References:

- a. Letter, AMSTL-BC, Hq, USATECOM, 3 April 1964,
Subject: Planning Directive for Engineering and Service Test
of Cartridge, Tracer, 5.56-mm, XM196, USATECOM Project No.
8-4-0210-02C.**
- b. Engineering Test Plan for Cartridge, Tracer, 5.56-mm,
XM196, USATECOM Project No. 8-4-0210-02C, dated May 1964.**
- c. Letter, AMSTL-BC, Hq, USATECOM, 14 July 1964,
Subject: Engineering Test of Cartridge, Tracer, XM196, USATECOM
Project No. 8-4-0210-02C.**
- d. Letter, AMSTL-BC, Hq, USATECOM, 17 July 1964,
Subject: Engineering Test of Cartridge, Tracer, XM196, USATECOM
Project No. 8-4-0210-02C.**
- e. Letter, AMSTL-BC, Hq., USATECOM, 9 October 1964,
Subject: Engineering Test of Cartridge, Tracer, XM196, USATECOM
Project No. 8-4-0210-02C.**

FOR INFORMATION ONLY, ACTION BY HIGHER AUTHORITY PENDING

STEAP-DS-TI

SUBJECT: First Letter Report on Engineering Test of Cartridge,
5.56-mm, Tracer, XM196, USATECOM Project No.
8-4-0210-02-C, DPS-1499 (L)

2. Background:

a. The Rifle, 5.56-mm (M16 and XM16E1) and the Cartridge, Ball, M193 have been adopted for use by the U.S. Air Force and by the U.S. Army Special Forces, Airborne, and Air Assault units.

b. The Cartridge, Tracer, 5.56-mm, XM196, is being developed for use with the M16 and XM16E1 rifles.

c. Development and Proof Services has been assigned the responsibility for planning, execution, and reporting of engineer testing of subject cartridge to determine its suitability for use with the M16/XM16E1 rifle.

3. Findings:

Functioning performance of the M16 and XM16E1 rifles with the XM196 tracer cartridge compared favorably with that normally obtained with the standard M193 ball ammunition.

The number of stoppages and parts breakages encountered were exceptionally low in all the weapons.

Cartridge case casualties were neither numerous nor serious, and caused no rifle stoppages.

Muzzle smoke and flash produced by the XM196 tracer was comparable to the M193 ball cartridge, and neither was excessive.

The penetration of the XM196 tracer cartridge, when fired into 1-inch pine boards, is superior to the M193 ball cartridge at ranges of 100 and 300 yards and is comparable to the M193 at 600 yards.

The M16 and XM16E1 rifles functioned without incidence, employing either the ball (standard) or tracer (test) cartridges, when fired at all attitudes.

STEAP-DS-TI

SUBJECT: First Letter Report on Engineering Test of Cartridge,
5.56-mm, Tracer, XM196, USATECOM Project No.
8-4-0210-02-C, DPS-1499 (L)

The XM196 cartridge meets the military specification (MIL-C-60111) requirements for function and casualty, fouling, trace and accuracy.

The data obtained from simultaneous accuracy at 100, 300 and 600 yards indicates that the XM196 tracer cartridge is ballistically matched with the M193 ball cartridge.

A cook-off can be expected with both the XM196 tracer and M193 ball cartridges if more than 120 rounds are fired rapidly.

The effect of vibration on the XM196 cartridge was insignificant insofar as visible damage was concerned. However, the 50 rounds subjected to vibration have not yet been fired for tracer performance.

The erosion characteristics of the XM196 tracer and M193 ball cartridges are comparable. The bores of the three M16 rifles subjected to the erosion test are considered serviceable (based on velocity and bore wear measurements) upon completion of 6000 rounds of firing through each.

Conclusions:

It is concluded that:

- a. The XM196 tracer cartridge performed satisfactorily with respect to loading, feeding, and firing from each of the six 5.56-mm rifles employed in this test.
- b. The test cartridge is compatible with the M16/XM16E1 rifle and can be utilized in firings from that weapon.
- c. The experimental tracer cartridge, as loaded, is ballistically matched with the M193 ball cartridge.
- d. From the firings conducted at Frankford Arsenal and this installation, the 5.56-mm tracer cartridge meets the requirements as outlined in the military specifications (MIL-C-60111).

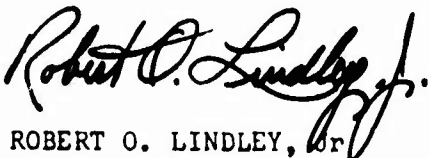
STEAP-DS-TI

SUBJECT: First Letter Report on Engineering Test of Cartridge,
5.56-mm, Tracer, XM196, USATECOM Project No.
8-4-0210-02-C , DPS-1499 (L)


5. Recommendations:

It is recommended that the XM196 tracer cartridge be considered suitable for service use with the M16 and XM16E1 rifles.

SUBMITTED:


ROBERT O. LINDLEY, Jr.
Test Director

APPROVED FOR THE DIRECTOR,
DEVELOPMENT AND PROOF SERVICES:


E. M. SENN
Lt Col., Ord Corps
Deputy Director for
Engineering Testing

DISTRIBUTION:

CG, USA CDC Combined Arms Group,
Fort Leavenworth, Kansas (1 cy)
CG, CDC Experimentation Center
Fort Ord, California (1 cy)
CO, USA CDC Sp Warfare Group
Fort Belvoir, Va. (1 cy)
CO, USA CDC Combat Service Support Group
Fort Lee, Va. (1 cy)
CO, USA CDC Inf Agency, Fort Benning, Ga. (1 cy)
CO, USA CDC Ord Agency, APG, Md. (1 cy)
CO, USA CDC Sp Warfare Agency
Fort Bragg, N.C. (1 cy)
CO, USA CDC Armor Agency
Fort Knox, Kentucky (1 cy)
CG, USAMC, Attn: AMSMU-AS, Dover, N.J. (3 cys)
CG, USA Weapons Command, ATTN: AMSWE-RD (3 cys)
CO, Frankford Arsenal, Attn: SMUFA-6000 (3 cys)
CO, USA Limited War Lab, APG, Md (3 cys)
CO, Springfield Armory (3 cys)
CO, US Arctic Test Center, APO 733, Seattle, Wash (1 cy)
Pres, USA Airborne, Electronics &
Sp Warfare Bd, Fort Bragg, N.C. (1 cy)
CO, USA Tropic Test Center, Panama (1 cy)
CG, USA Supply & Maint Cmd, Attn: AMSSM-MR (1 cy)
Dir, Marine Corps Landing Force Dev Center, Quantico, Va (1 cy)
U.S. Marine Corps Liaison Officer, USATECOM, APG (1 cy)

4



HEADQUARTERS
U.S. ARMY TEST AND EVALUATION COMMAND
Aberdeen Proving Ground, Maryland 21005

9 OCT 1964

AMSTE-BC

SUBJECT: Engineering Test of Cartridge, Tracer, 5.56mm, XML96
(USATECOM Project No. 8-4-0210-02C)

TO: Commanding Officer
Aberdeen Proving Ground
ATTN: STEAP-DS
Aberdeen Proving Ground, Maryland 21005

1. Reference is made to Planning Directive, Hq USATECOM, subject above, 3 April 1964.
2. Para 9b(1) of the cited reference directed that interim reports of test be submitted to this headquarters within ten (10) working days after completion of testing.
3. Service Test of the XML96 Cartridge by the USA Infantry Board has been completed and the final report of test was forwarded on 10 Sep 1964.
4. There is a requirement that USAMUCOM and the Project Manager M16 be furnished data as to the performance and suitability of the XML96 cartridge for use as soon as possible, in order that type classification action and limited procurement can be undertaken to meet current overseas operational requirements.
5. It is the understanding of this headquarters, based on discussions with the Project Engineer, Mr. Lindley, that engineering test of the XML96 cartridge has been completed with the exception of:
 - a. Brush deflection.
 - b. Observation of trace under certain conditions of visibility.
 - c. Part of the accuracy determination involving 7.62mm ammunition for comparative purposes.
6. The following actions are directed:
 - a. Cancel further brush deflection testing.

8 OCT 1964

AMSTE-BC

SUBJECT: Engineering Test of Cartridge, Tracer, 5.56mm, XM196
(USATECOM Project No. 8-4-0210-02C)

b. Submit to this headquarters not later than 23 October 1964 a partial report, covering the results of testing to date, to include appropriate comments and observations.

c. Upon completion of the above, complete remaining tests, submitting final report not later than thirty (30) days thereafter.

FOR THE COMMANDER:


OLIVER H. ASPINWALL, JR.
Capt, AGC
Asst Admin Officer



OFFICE OF THE COMMANDING GENERAL
U.S. ARMY TEST AND EVALUATION COMMAND
Aberdeen Proving Ground, Maryland 21005

AMSTE-BC

17 JUL 1964

SUBJECT: Engineering Test of Cartridge, Tracer, 5.56MM, XM196 (USATECOM
Project No 8-4-0210-02C)

TO: Commanding Officer
Aberdeen Proving Ground
ATTN: STEAP-DS
Aberdeen Proving Ground, Maryland 21005

1. Reference: Development and Proof Services Plan of Test, subject
above, May 1964.

2. Request that in addition to the tests listed in the reference,
the penetration characteristics of the test cartridge be determined by
firing against pine boards, steel helmets, and armor vests at ranges
of 100, 300, and 600 yards. The report of test will include a comparison
of the results obtained with the penetration characteristics of the M193
5.56MM ball cartridge, the M80 7.62MM ball cartridge, and the M62 7.62MM
tracer cartridge.

FOR THE COMMANDER:

Copy furnished:
CG USAMC ATTN: AMCRD-DW
Pres, USAIB ATTN: STEBC-SA
USACDC LNO, USATECOM

James J. Smith
for **EARL R. EICHENBUECH**
Major, AGC
Asst. Admin. Officer



HEADQUARTERS
U.S. ARMY TEST AND EVALUATION COMMAND
Aberdeen Proving Ground, Maryland 21005

14 JUL 1964

AMSTE-BC

SUBJECT: Engineering Test of Cartridge, Tracer, 5.56MM, XM196 (USATECOM
Project No 84-0210-02C)

TO: Commanding Officer
Aberdeen Proving Ground
ATTN: STEAP-DS
Aberdeen Proving Ground, Maryland 21005

1. Reference is made to Engineering Test Plan for Cartridge, Tracer, 5.56MM, XM196, Development and Proof Services, Aberdeen Proving Ground, May 1964.

2. Request that in addition to the tests outlined in the cited reference, tests be conducted to determine whether the XM196 cartridge generates sufficient operating energy to insure reliable automatic functioning of the M16/XM16E1 rifles when fired with weapon held horizontally; with muzzle depressed 45 degrees below horizontal; and with muzzle depressed 90 degrees below horizontal.

FOR THE COMMANDER:

Copies furnished:

CG USAMC, ATTN: PMSO-AM15

CG USAWECOM, ATTN: PM-AR15

CO Frankford Arsenal, ATTN: SMUFA-390

Pres, USAIB, Ft Benning, Georgia ATTN: STEBC-SA

John Hall
for **EARL R. EICHENBERGER**
Major, AGC
Asst. Admin. Officer

COPY/bm

HEADQUARTERS
U.S. ARMY TEST AND EVALUATION COMMAND
ABERDEEN PROVING GROUND, MARYLAND 21005

AMSTE-BC

3 APR 1964

SUBJECT: Planning Directive for Engineering and Service Test of
Cartridge, Tracer, 5.56mm, XM196

TO: President, U. S. Army Infantry Board, Fort Benning, Ga. 31905
President, U. S. Army Arctic Test Board, APO 733, Seattle,
Washington
Commanding Officer, Aberdeen Proving Ground, ATTN: STEAP-DS,
Aberdeen Proving Ground, Maryland 21005

1. References:

- a. AMCTC Item 1736, 18 Feb 1964.
- b. USAMJCOM Commodity Master Plan for Cartridge, 5.56mm, for Rifle, M16.
- c. AR 705-15, w/change 1 dated Oct 1963.

2. Purpose. This is a planning directive for test of the Cartridge, Tracer, 5.56mm, XM196. Upon receipt, addresses are directed to initiate planning in accordance with responsibilities outlined herein.

3. Description of Materiel. The XM196 Tracer Cartridge consists of the standard M193 ball cartridge case and primer assembly. The bullet has a gilding metal jacket around a halved lead core. The pyrotechnic components, which are located to the rear of the halved lead core, consist of the igniter and tracer mix. The assembled bullet weighs approximately 55 grains and is flat-based. The bullet tip is colored orange to facilitate identification.

4. Background.

- a. The Rifle, 5.56mm (M16 and XM16E1) and the Cartridge, Ball, M193 have been adopted for use by the U. S. Air Force and by U. S. Army Special Forces, Airborne, and Air Assault units (ref a).
- b. The cartridge, tracer, 5.56mm, XM196, is being developed for use with the M16/XM16E1 rifles.

COPY/bm

3 APR 1964

AMSTE-BC

SUBJECT: Planning Directive for Engineering and Service Test of Cartridge, Tracer, 5.56mm, XM196

c. Drawings and specifications of the tracer cartridge and reports of ballistic tests performed at Frankford Arsenal will be forwarded by this headquarters to test agencies when available.

5. Test Objective. To determine the suitability of the Cartridge, Tracer, XM196, for use with the M16/XM16E1 Rifle. Since no QMR, military characteristics, or technical characteristics are available for the test cartridge, test agencies will use appropriate 7.62mm weapons and ammunition for control purposes and will determine:

a. The ballistic compatibility of the test cartridge with the M193 ball cartridge, in comparison with that of the 7.62mm M62 tracer relative to the 7.62mm M80 ball cartridge.

b. Commensurate with range-accuracy capability, the overall suitability of the test cartridge for use with the M16/XM16E1 Rifle, in comparison with the suitability of the 7.62mm M62 Tracer with the M14 Rifle.

6. Responsibilities.

a. Development and Proof Service, Aberdeen Proving Ground, Md. is responsible for planning, execution, and reporting of engineer testing. Engineer tests to be conducted will include:

(1) Physical characteristics; safety, cook-off, functioning, and ballistic properties.

(2) Initiation, termination, intensity, and visibility of tracer element.

(3) Within the limitations of facilities available, a determination of cartridge performance under hot, intermediate, and cold climatic conditions and other adverse environments.

(4) The effects of vibration and rough handling should be considered.

b. The U. S. Army Infantry Board, Ft Benning, Georgia is responsible for planning, execution, and reporting of service test to determine the suitability of the test cartridge for use under temperate (intermediate) climatic conditions.

COPY/bm

3 APR 1964

AMSTE-BC

SUBJECT: Planning Directive for Engineering and Service Test of Cartridge, Tracer, 5.56mm, XM196

c. The U. S. Army Arctic Test Board is responsible for planning, execution, and reporting of tests to determine the suitability of the test cartridge for use in the lower limits (-25°F) of intermediate climatic conditions, and to provide data upon the performance and suitability for use of the test cartridge under cold and extreme cold climatic conditions.

d. For definitions of intermediate, cold, and extreme cold climatic conditions, see reference 1c.

7. Coordination. The U. S. Army Infantry Board will informally coordinate the plan of service test with the U. S. Army Combat Developments Command Infantry Agency and the U. S. Army Infantry School.

8. Special Instructions.

a. It is expected that materiel will be available for test in the quantities and on the dates indicated:

(1) Engineering Test: 20,000 rounds, 15 May 1964.

(2) Service Test: 30,000 rounds, 15 May 1964.

(3) Arctic Environmental Test: 30,000 rounds, 1 September 1964.

b. Addressees will advise this headquarters of materiel requirements (other than test ammunition) at the earliest practicable date.

c. USATECOM Project Numbers are assigned as follows:

(1) Engineering Test: 8-4-0210-02C.

(2) Service Test: 8-4-0210-03C.

(3) Arctic Test: 8-4-0210-04C.

d. D&PS will inform this headquarters of funding requirements at the earliest practicable date.

9. Test Plans and Reports.

a. Engineering and Service Test Plans will be submitted to this headquarters (AMSTE-BC) not later than 1 May 1964; Arctic Test Plan will

COPY/Lm

3 APR 1964

AMSTL-BC

SUBJECT: Planning Directive for Engineering and Service Test of Cartridge,
Tracer, 5.56mm, XM196

be submitted not later than 30 October 1964. Plans of Test will include an annex indicating those agencies with which informal coordination has been accomplished, and, when appropriate, comments are incorporated into the test and reasons therefor.

b. Reports of test will be submitted by DEPS and U. S. Army Infantry Board as follows:

(1) Interim report: Within ten (10) working days after completion of testing.

(2) Final report: Within thirty (30) days after completion of testing.

c. Instructions for submission of Arctic Test report will be provided separately.

d. Distribution of plans and reports of test: Inclosure 2.

10. Security. This project is UNCLASSIFIED.

FOR THE COMMANDER:

3 Incls

1. USAMCOM Commodity Master
Plan for Cartridge, 5.56mm
2. Distribution for Reports of Test
3. TEAMS Sheets

/s/ Robert A. Bailey
/t/ ROBERT A. BAILEY
1st Lt
Asst Admin Officer

Copies furnished:
USACDC LNO (USATECOM)
USMC LNO (USATECOM)